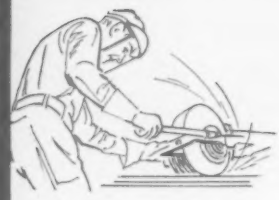
National Safety News

THE CHIPRUF VISOR → FOR IMPACT RESISTANCE



THE CHEMPRUF VISOR → FOR CHEMICAL SPLASHES

To meet *both* hazards effectively and economically *you need these TWO*

M·S·A VISORS

Good design in a faceshield means not only protection for the wearer—but *self-protection* for the visor to effect economy in operation!

That's why it's bad business to make one faceshield do the work of two. The safeguard may be reduced; equipment life is *sure* to be.

These new M.S.A. Standard Faceshields with interchangeable, special-purpose visors, combine a full measure of protection plus a full measure of economy. M.S.A.'s "Head-Line" Design Preformed Headgear, available in three popular types, is easily adjusted to any head size, provides friction locks for positioning visor and shield, has a non-chafing padded sweatband, and is comfort-engineered for all-day wear. Snap fasteners make it easy to install the visors . . .

CHIPRUF . . . for sanding, light grinding, wood working, hot metal pouring, glass manufacturing or any similar operation where face protection from flying particles is needed.

CHEMPRUF . . . designed to combat splash or spray hazards from acids, oils, alkalis, hot liquids and similar fluids.

These visors are also available on M.S.A. Super-gard Faceshields, which extend the protection well around the sides of the worker's head.

Bulletin No. CN-4 will give you complete details. If you would like a demonstration in your own shop, just write.

MSA

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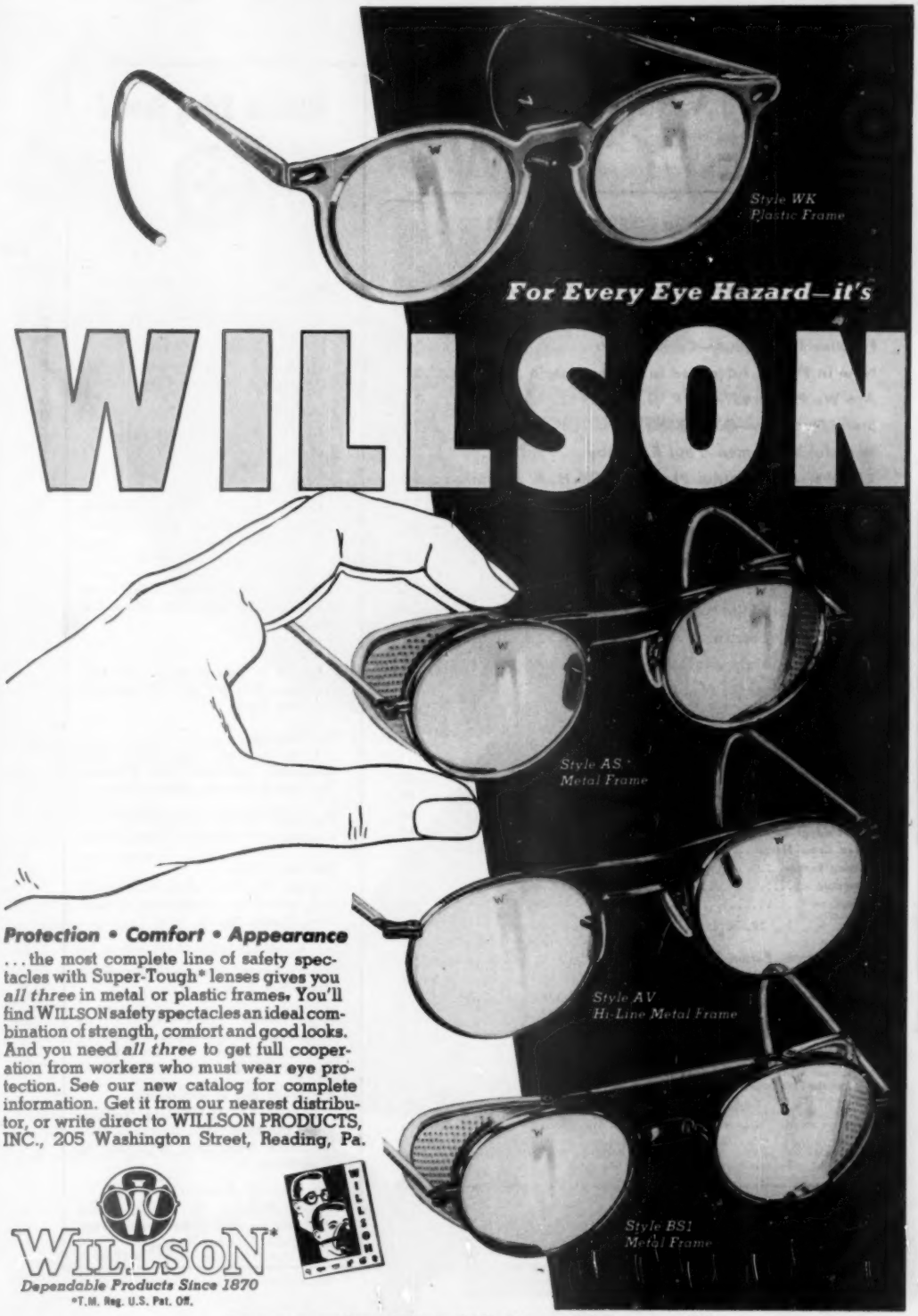
BRADDOCK, THOMAS and MEADE STREETS • PITTSBURGH 8, PA.

At Your Service

54 BRANCH OFFICES IN THE UNITED STATES AND CANADA

CALL THE M.S.A. MAN ON YOUR EVERY SAFETY PROBLEM . . . HIS JOB IS TO HELP YOU.



Protection • Comfort • Appearance

. . . the most complete line of safety spectacles with Super-Tough* lenses gives you *all three* in metal or plastic frames. You'll find WILLSON safety spectacles an ideal combination of strength, comfort and good looks. And you need *all three* to get full cooperation from workers who must wear eye protection. See our new catalog for complete information. Get it from our nearest distributor, or write direct to WILLSON PRODUCTS, INC., 205 Washington Street, Reading, Pa.

WILLSON*

Dependable Products Since 1870

*T.M. Reg. U.S. Pat. Off.

For your convenience, Willson distributors are listed on page 114.

NATIONAL SAFETY NEWS

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VOLUME 63 • NUMBER 2

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ORDER summer shoes NOW!

for delivery when you need them

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No. 1615—Tan elk with heavy, single oiled oak leather sole, half rubber heel with leather base. A and B —sizes 6 to 12; C, D, E, EE—5 to 13.

safti-vents
No. 1621—Brown bal; single oak leather sole, half rubber heel with leather base, lined counter, green Nado lined quarter. A and B—sizes 7 to 12; C, D, E—5 to 12.

Sound funny to sell summer shoes in the winter? Last year, these two styles were a sellout. The only way we can deliver more pairs this year is if we can anticipate your needs. They put an end to "Summer Hotfoot". . . keep men cool . . . comfortable and on the job. They're so good looking your men will be proud to wear them on the street as well as in the plant. That means ONE pair instead of two for your employees . . . fewer foot and toe injuries for you! We urgently request that you figure your needs for this type of shoe and get your order in at once for May or June delivery. We'll ship whenever you want them. And we'll be better able to fill you in later on with additional pairs from stock.

exclusive
"sock-**saver**" leather toe lining
(pat. pend.)
Ends tearing socks • Feels more comfortable

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The Safest . . . The neat wrapping of strands around the rope, and the steel sleeve locked over the wire ends, prevents snagging. DUALOC can be grasped by bare hands. And, it is always "open" for inspection. You can see that the ending is safe to use. DUALOC *is the safest wire rope ending.*

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Proof-tested at twice the rated capacity
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Made by laying up seven individual wire ropes. Gives extreme flexibility. Equipped with **DUALOC.**

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8-Part Braided. This construction has a symmetrical body which gives all-around flexibility plus great strength.

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WIRE ROPE SLING DEPARTMENT

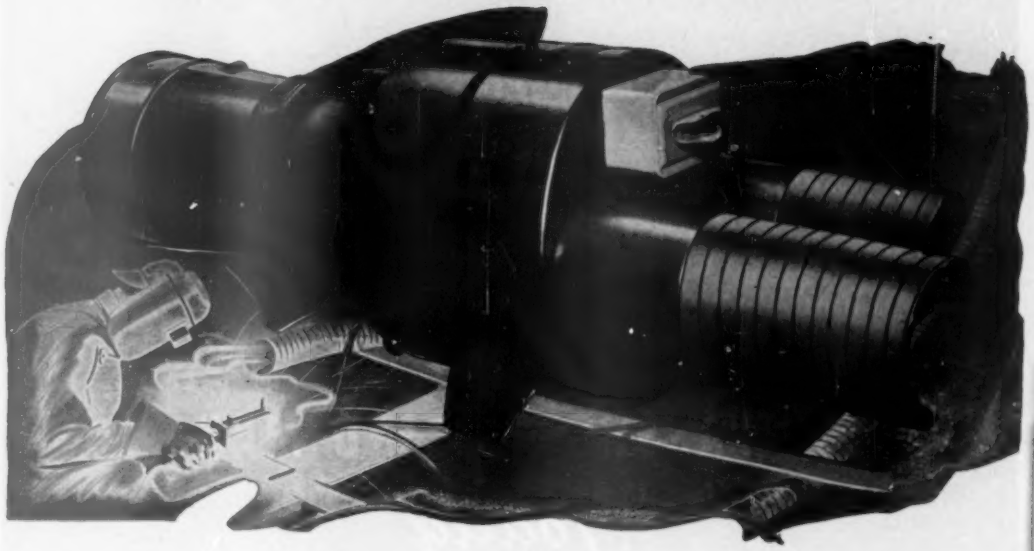
TRADE MARK

In Business for Your Safety

DUALOC *"Intentionally Better"* WIRE ROPE SLINGS

An Extra Lung for A Man

HAVING TROUBLE BREATHING



The amount of work a man can do goes *down* when foul air comes *in* or the heat goes *up*. Are you giving your workers the equipment that will keep them efficient even when working in hot or noxious fumes?

Many concerns regard Coppus Blowers as "production tools" as well as "safety equipment". They help men to do more work and better work.

You can find in the Coppus line the right blower or exhauster for each "bad spot"—or perhaps one type will handle a variety of jobs. In addition to man-cooling and removing fumes from confined places, Coppus Blowers are used for cooling and drying materials and equipment. They are portable . . . efficient . . . built to Coppus "Blue Ribbon" standards of construction and workmanship in order to withstand severe usage.

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Please send me information on the Blowers that clear the air for action.

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- ☐ stirring up stagnant air wherever men are working or material is drying.

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1 SELL EYE SAFETY TO EMPLOYEES
Ask your distributor's representative to show you the kit of posters, pay envelope inserts, PA system scripts and other material that sells workers forcefully on *desire to use* proper safety eyewear.

2 SAFETY GLASSES FOR EACH JOB
A complete range of Bausch & Lomb safety eyewear, engineered to meet the most rigid tests for each job classification in your plant.

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THAT'S the title of a story written to one of the workers now on your payroll.

Which one?

The "one" who is thoughtless—who understands the purpose of eye safety measures *only* when it's put to him dramatically, graphically.

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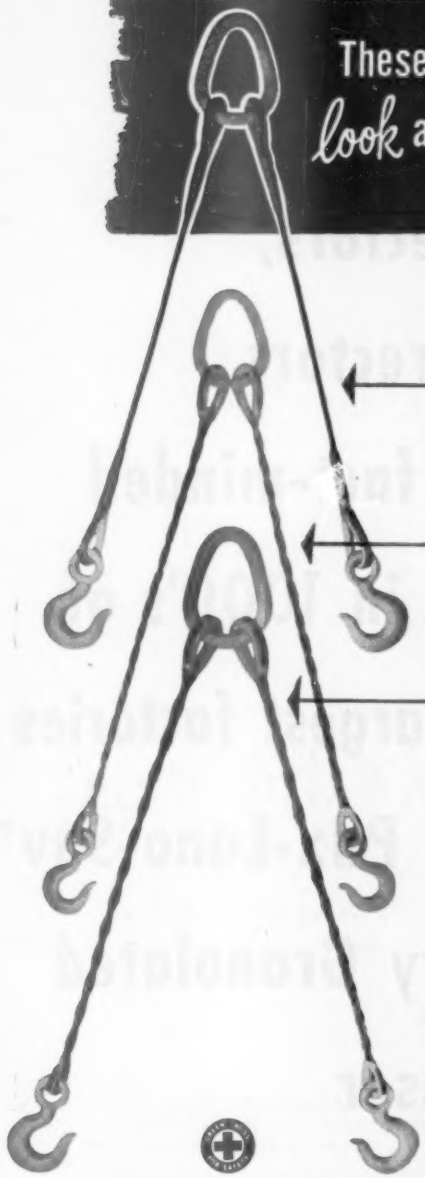
BAUSCH & LOMB *Safety Eyewear*

These 3 Macwhyte Slings *look* alike but they're *different!*



Assembly E-2 Single-part body

THE MONARCH SLING

Made from a single-part of Monarch Whyte Strand Wire Rope. Many sizes and types.

Assembly E-2 6-part flat-braided body

THE DREW SLING

Braided from one endless wire rope — very flexible and kink-resistant. Many sizes and assemblies.

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Made from endless right and left lay wire rope. Hugs the load, gives maximum flexibility and safety. Many sizes and types.

Get the sling that's a "perfect fit" for your needs from Macwhyte's wide variety in size and construction

All three slings shown above are of the same basic type. *But* the legs or bodies of each are of different construction and flexibility — to meet various service conditions. These slings *only indicate* the wide variety in sizes and styles of Macwhyte Slings. All are custom-made to your order — in any length. Why not get the benefit of our experience in saving time and money for hundreds of satisfied users. Call any Macwhyte distributor or write Macwhyte Company today — about any sling problem you have.

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MW-6

For cranes and hoists use *PREformed* MONARCH WHYTE STRAND CRANE ROPE *made by* MACWHYTE COMPANY

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Manufacturers Of Fine Industrial Skin Cleansers, General-Purpose Cleaners, Degreasers And Dishwashing Compounds

*Tradename of G. H. Packwood Mfg. Co.

Career girl, 1965

Little Miss Telephone herself. Thirty-five members of her family have worked for the telephone company.

That's Karen Terry — She's just three and cute as a button. Already she's decided to be a telephone operator when she grows up.

There are many reasons for her choice. For Karen is related to an interesting telephone family in California. Thirty-five members of this family have worked for the telephone company in the past sixty-five years. Many still do.

Lots to Talk About — When Karen's Aunt Ella was asked what the dinner conversation is like when they get together, she said — "Why we talk shop, of course. All about the telephone company and our friends there."

It's that way with thousands of other families. One Bell Telephone Company found that 2800, or ten per cent, of its employees had members of their families in telephone work.

Stepping Ahead — A young man doesn't follow his Dad in a job unless Dad says, "Come along, son — you'll find it as good a place as I did." You won't find sister following sister, and brother following brother into telephone work without reason. They like the work and the company.

Good people in good jobs help to give this country the best telephone service in the world at low cost.

BELL TELEPHONE SYSTEM

Now for the FIRST TIME...

LIFETIME Plastic Defect Card Holder

Guaranteed for the life of the car against becoming inoperative due to corrosion or exposure to the elements.

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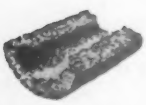

Spring Packing

Pittsburgh Carbon Brushes

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Plastic used on Freight Cars!

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PLASTIC
Defect Card Holder

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With the introduction of the LIFETIME Defect Card Holder . . . made of tough, fabric-filled Fibrette phenolic plastic . . . your road is assured of an inexpensive card holder that *actually outlasts the life of the car!*

Spring Packing LIFETIME Defect Card Holders do not dent in storage, will not rust out, withstand the blows of flying ballast, never become unusable due to corrosion. Their built-in luminosity, availability because of non-essential materials, and LOW COST are additional attractive features.

For full information about these competitively-priced card holders that need never be replaced write, *today!*

For 31 Years *the Standard*

SPRING PACKING CORPORATION

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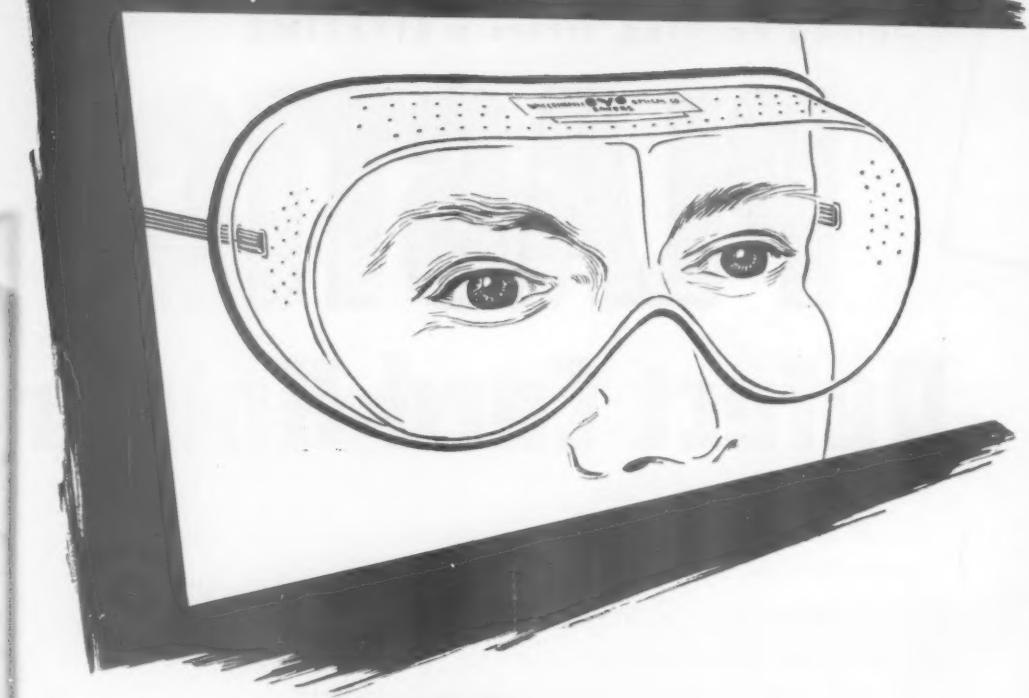
Working Eyes KEEP Working...



When eye SAVERS stand guard!

Light, attractive and safe . . . Watchemoket's D-LUX goggle gives *sure* eye protection.

For more information call your local distributor or write direct.

WATCHEMOKET OPTICAL CO., INC.

PROVIDENCE • RHODE ISLAND

WATCHEMOKET eye SAVERS

IN CANADA • LEVITT-SAFETY LIMITED, TORONTO 12, MONTREAL 1

the DIRTIER the better for LAN-O-KLEEN!

DIRT that's really hard to remove . . . that's deeply imbedded in workers' hands . . . that irritates cuts and abrasions—directly affects production figures! Think of the materials your present cleaner won't remove: graphite and metallic dust . . . heavy grime and lubricants . . . even common soil and office dust—no matter how hard you scrub!

LAN-O-KLEEN, the industrial soap powder, is designed for "heavy-duty" dirt removal. A fine corn meal base sponges out the pores . . . while thick suds sweep away surface dirt. As water is added, soothing Lanolin spreads over the skin, leaving hands fresh-feeling and clean as a whistle. Its soothing emollient action won't aggravate cuts and bruises. Further, Lan-O-Kleen and the sturdy Lan-O-Kleen dispenser are a dollar-saving combination—as a West representative can easily demonstrate.

LAN-O-KLEEN the industrial hand cleaner containing LANOLIN

WEST DISINFECTING Company

Show me the hand cleaner that will remove stubborn dirt!

West Disinfecting Company, 42-16 West Street, Long Island City 1, N. Y.
(64 Branches in the U. S. and Canada)

Gentlemen: I'd like to have a local WEST representative come out and give me a demonstration of Lan-O-Kleen.

Mr. _____ Position _____

Company _____

Address _____

City _____ Zone _____ State _____

7

STONEHOUSE SIGNS
For Accident Prevention

For those who may not *Remember*

MEN OFTEN FORGET to be careful. Forgetting and being careless lead to many accidents.

So it's well to remind workers that thinking and working safely not only produces better work but helps prevent accidents.

Stonehouse "Reminder" signs do much to educate and remind workers—to help them guard against unsafe practices, thoughtlessness and forgetting to be careful.

STONEHOUSE steel SIGNS
For Accident Prevention

Stonehouse complete Catalog No. 9 contains many hundreds of different Accident Prevention Signs covering hazards in industry. Free copy of catalog on request.

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And lastly, the Employers Mutuals Man—capable local representative of a mature, seasoned organization—points the way to these mutual employer-employee benefits by explaining insurance matters in simple, understandable terms. He will gladly show you how Employers Mutuals' skilled services... sparked by specialists in safety engineering, accident prevention, industrial hygiene, fair and considerate claim settlement... can be put to work for the benefit of your entire organization, and be reflected in savings on your insurance costs!

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YES, HY-TEST GIVES YOU ALL FOUR STYLE COMFORT QUALITY and PROTECTION

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Men's brown lace-to-toe, resist-oil outsole, leather midsole, resist-oil heel.

H727-1
Men's black blucher, cord outsole, leather midsole, cord heel.

. . . Insure Workers' Feet in Sure Protection

with

HY-TEST SAFETY SHOES

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HY-TEST SAFETY SHOES

NATIONAL
SAFETY NEWS

FEBRUARY, 1951

A Collision Echoed Around the World

A Guest Editorial by

PHIL F. CARSPECKEN

Engineering Publications Editor
Employers Mutual Liability Insurance Company of Wisconsin

YOUNG combat officer Sam Walker awaited the event with anxious pride, there on the Korean front. He'd spurned a safe job as commander's aide, and asked for battle action. He'd gotten it, too, and met his baptism of fire like a thoroughbred. Now — at this very moment — the general was on his way up to the front to decorate him. Yes, *him—Sam Walker*!

But the warm pride in Captain Walker's heart suddenly vanished, as cold and sickening grief swept in to take its place. Word had come that somewhere down the line, the general's jeep had collided with a three-ton weapons carrier. The general was dead.

Commander Walton Walker never made it to the front. An accident cruelly ambushed him, just short of one of the proudest triumphs of his battle-scarred career — the decoration of his own son, for gallantry in action.

Once more Sam Walker proved that he had inherited a spine of steel from his father. He took the crushing news with his head up. And later in a Seoul hospital, it was only human for the lad to break down for a brief spell as he did, standing there beside the still form of his father, shrouded in a GI blanket.

The United Nations, too, were stunned by this tragedy. "The Little Bulldog" from Texas was a brilliant general. Under Patton in World War II, he had developed an uncanny knack for coordinating infantry and armored groups. You remember the dazzling tactics of Patton's armored "ghost corps" in France. And you remember that, ironically, Patton was also ambushed by a fatal accident.

Of course, an able leader carries on in Commander Walker's place. But a certain uncanny knack — a rare brand of battle-hardened genius — was forever lost to us in that instant when a jeep and a hulking weapons carrier came together. That jeep carried special protection against road mines . . . but an unexpected accident found it wide open for a death-thrust.

Our Eighth Army's commander fell to the most ruthless of all enemies; one who strikes with the deadly fire-power of human error. There is no foe so powerful, so widespread, so totally remorseless as this common enemy of mankind!

Every accident — whether in Korea, or in a factory in Middletown, U.S.A. — is a weakening blow, draining us of a priceless measure of human energy and skill, equipment, materials, time, morale. In reckoning the cost, let us always remember that a single accident in Korea made every member of the United Nations wince in pain. The metallic thud of one collision echoed around the world!

These are uncertain, foreboding times, calling for the kind of backbone metal that Commander Walker had . . . and that Captain Walker has. We must keep hoping for the best, even as we strengthen ourselves for the worst. Now — more than ever before — *we cannot afford accidents*!

Function Plus Beauty

By CARMAN FISH

A tower of unusual design and construction provides safe, healthful and pleasant quarters for research

TOWERING ABOVE the city of Racine, Wisconsin, is an imposing square tower with walls of horizontal glass tubing divided by narrow bands of brick. The base of the tower, however, is not visible from the street and only those who enter the courtyard can fully appreciate its unorthodox design.

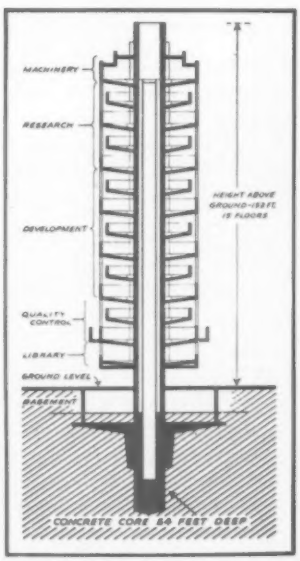
This shaft, 154 feet high and 40 feet square, rests on a column 13 feet in diameter at its narrowest point. There is no foundation under the walls; they seem to be hanging in air.

"Heliolab" is the name given this sensational structure by its designer, Frank Lloyd Wright, called by *Life* Magazine "U. S. architecture's arbitrary dean." The name appropriately combines the Greek word for sun with a familiar abbreviation for laboratory. The arrangement of tubing admits well diffused daylight to all work areas and the effect is one of lightness and airiness. And at night the illuminated tower sometimes looks like a huge electrical coil.

Here technicians of S. C. Johnson & Son, Inc., are engaged in research and development work and quality control in the manufacture of a wide variety of waxes and other finishes designed to lighten the housekeeping job in home and industry.

In dedicating the building on November 17, 1950, President Herbert F. Johnson, Jr., said: "I hope that this building, in which beauty and function have been so spectacularly combined, will prove an inspiration to the men and women who work in it and to those who honor us by coming to see it."

Those who work there are en-



Cross-sectional diagram of the tower. Floors are cantilevered from the central core of reinforced concrete which contains elevators, stairways and ducts for various building services. The structure is anchored in a concrete base.

Research and development tower and administration building of S. C. Johnson & Son at Racine, Wis., Laboratories are housed in the glass-walled tower and offices are in the windowless building at the right of the group.

Walls of glass tubing, with an inner wall of plate glass, provide diffused light for laboratory work. Safety showers are within easy reach of all sections.

thusiastic about the environment, and visitors, even the conservative ones, admire it after recovering from the first shock of the unorthodox design. My own tastes, which had always been strong for the traditional, underwent considerable change in a few hours spent in the tower and the adjoining administration building.

Anyone familiar with architecture would recognize this imposing group as the work of Frank Lloyd Wright. Many people, no doubt, have a feeling that his unorthodox creations are inspired merely by a fondness for the bizarre. But there is method in every detail of his design and the resulting buildings are thoroughly practical. It is interesting to note, too, how safety features were incorporated in the Johnson tower, either through direct planning or as the concomitant of sound design.

In addition to the tower, the structures in the Research and Development center include a three-story building housing the company's new advertising quarters, the technical service department, and a lounge area.

Adjoining the tower is a pilot plant, actually two stories in height but with one story underground.

A large garage and carport is located within the outer wall which encloses all buildings and their surrounding courtyard.

Among the features is a small greenhouse which provides decorative plants to fill the bronze plant holders built into the curves and angles of individual offices. One of Wright's commendable principles of decoration is to "bring the outdoors indoors." Exterior plantings fill the areas around the tower base and the columns near it, and between buildings.

The administrative offices of the company, also designed by Wright and completed in 1939, form part of the group. While windowless buildings with controlled light and ventilation were not entirely new then, the idea was sufficiently novel to attract wide attention.

Less spectacular than the tower and administration building are the manufacturing areas. Two new wax manufacturing plants of fire-resistant construction were erected

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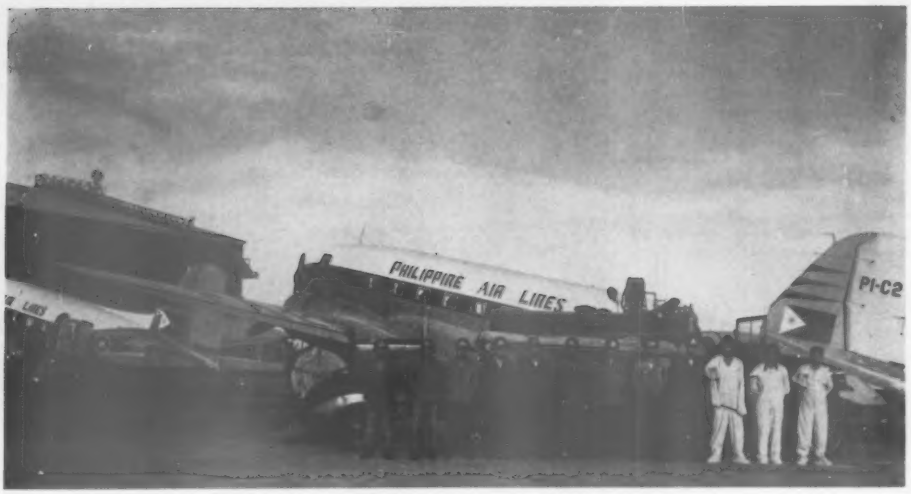
A two-story pilot plant, half of which is underground, was designed for the company's experimental engineering department to carry out their work in developing manufacturing processes. The grating on the floor covers a duct through which dirt from the floor is flushed away.



Firemen of the second-shift brigade of Philippine Air Lines line up with their equipment for a Fire Prevention Week demonstration.

New in Flying . . . Advanced in SAFETY

By SERGIO SOLIMAN

Through its industrial safety program, Philippine Air Lines is developing a safety-minded organization

RELATIVELY a newcomer in the field of commercial aviation, the Philippine Air Lines has organized a safety program which has proved satisfactory in both the technical and human aspects. Much of the success of the program can be attributed to the company's membership in the National Safety Council.

Being fully aware of the importance of the human factor in the promotion of a productive safety program, officials of the company developed a plan for effective teaching of the safety gospel. Ranking key men from all departments of the company were schooled in the Industrial Safety Engineering and Human Engineering Course.

The textbook used was *Industrial Safety*, edited by Roland P. Blake, of the U. S. Department of Labor. A complete set of training films on *Safety Management for Foremen* and *Human Factors in Safety* from the National Safety Council and materials from a complete set of our *Safety Men's Library* were found indispensable.

An interesting phase of the course was the study of human engineering. The principal textbook was *How to Win Friends and Influence People*. Human behavior and vanities as interpreted by great men from ancient times to the present were discussed and analyzed by the students who took turns in giving lectures. This course was intended to develop maximum cooperation from the

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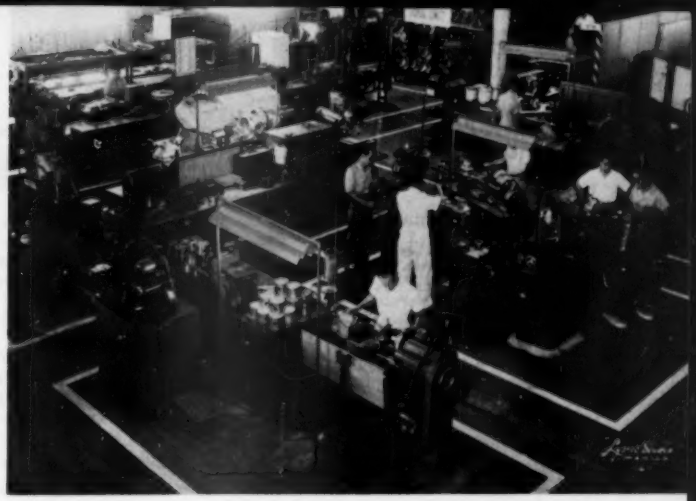

A section of the engine and flight equipment overhaul shop. Aisle markings, careful layout and arrangement, color conditioning on machines, and attention to cleanliness mean better and safer work.

whole personnel through their key men.

After the six month course they were graduated as industrial safety engineers with appropriate ceremonies. Diplomas signed by the president of the company were awarded.

The employees' attitude toward safety depends to a great extent on the attitude of the key men. If the key men are indifferent, due to lack of training or the absence of a systematic program, the subordinates will likewise be indifferent. However, if the key men believe and practice safety to convince the men under them that they are in earnest and are doing everything in their power to protect them, then safety can be made an integral part of their daily activities.

These graduates, 38 in all, ranging from division superintendents, senior shop foremen to plane crew chiefs, function as the safety engineers and chairmen of safety committees of their respective groups. These were organized into a safety body. At its first meeting it was named the "PAL Plant Safety Council" and a chairman, vice-chairman and secretary were elected by the members.

Procedures, aims and functions of the PAL Safety Council are similar to those described in *Safe Practices Pamphlet No. 72* of the National Safety Council. Items calendared on its agenda and approved during its periodic meetings are reviewed for final discussion and adoption by a central committee composed of the following:

1. Vice-president — director
2. Personnel manager
3. Assistant vice-president, operations
4. Medical officer and president of the Employees Union
5. Chairman, PAL Plant Safety Council
6. Vice-chairman, PAL Plant Safety Council
7. Secretary, PAL Plant Safety Council
8. Two or three members of the Safety Council sponsoring items for discussion
9. Company safety engineer

It is believed that projects for the furtherance of safety are more effective when sponsored by the key men than when imposed by management. As a logical consequence of the presence of ranking officials on the safety committee, an atmosphere of interest, enthusiasm and respect prevails at committee meetings.

Within the framework of the PAL Safety Council and the central safety committee, activities vitally important in the promotion of safety are being conducted.

Fire Protection

Prominent in the program are fire prevention and protection. In these activities materials from the National Safety Council have also proved indispensable.

Strict compliance with the requirements of our fire underwriters

"Smoking" and "No Smoking" areas are clearly marked and the rules strictly enforced.

is maintained. Following is a summary of the program:

1. Education

In addition to training key men in fire prevention and protection, the following methods were used to teach the fundamentals to employees:

a. Exhibition of the following 16 mm. sound motion pictures to all personnel:

Chemistry of Fire — 45 minutes running time.

Ground Crew Safety — 25 minutes.

Supervision, Developing Cooperation — 15 minutes.

b. Periodic lectures in shops and hangars on the essential measures of fire protection.

2. Fire Department

A fire department was organized with 10 employees from each of the three shifts. These men had been trained in a regular fireman's course by qualified instructors from the Manila Fire Department and USAF Crash Fire Fighters.

Surprise fire drills are held from time to time and responses come within 30 seconds in spite of the fact that the firemen are scattered in their regular occupations. Each key man knows his regular duties in case of emergency.

In shops like the engine overhaul repair shop where there are more than 100 employees in a single hangar, auxiliary fire brigades were organized. Every employee in the shop knows exactly what to do should an emergency arise.

A fire engine of the Chrysler type capable of producing a pressure of 400 pounds along two hose lines was provided. Main accessories are:

Six 2½-inch double cotton jacket rubber lined hose, with underwriter's specification of 400 pounds psi.

Eight 2-inch hoses of same specifications.

2 all-purpose nozzles for the above hoses.

Three fog applicators — 2 for the 2½-inch hoses and one for the 2-inch hose.

Halligan tools (all purpose fire tool —developed by Mr. Halligan of New York Fire Department). Three distributed at the area and one for the fire department.

An attached water tank of 750 gals. capacity.

A fire siren installed at the fire truck.

Four asbestos suits for crash fire fighting.

Four 15-pound capacity CO_2 fire extinguishers.

Six 50-pound capacity CO_2 tank connected in parallel with a 50 foot hose and horn.

3. Fire Hydrants

There are 26 fire hydrants, strategically located. There is a fire hydrant for every two sides of a building.

4. Fire Extinguishers

There are more than one hundred fire extinguishers located at our area. Around eighty per cent of these are of the 15-pound CO_2 and the rest are of the 2½-gallon foam and soda acid and dry chemical type. The type and capacity have been previously determined,

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When it is necessary to get into locked buildings in an emergency, the "Halligan tool" is a useful device. (Above it is an NSC poster.)

Hydrants are strategically located and marked conspicuously.

The air-conditioned classroom is equipped with audio-visual training aids.

Are We Prepared?

By W. R. G. BAKER

Civil defense, World War II pattern, is obsolete. Understanding today's problems is the first step in forestalling the surprise and panic that would sap our national strength.

IF OUR COUNTRY is in danger of being attacked, then it logically follows that certain actions must be taken, certain plans must be made. Of foremost importance is military preparedness to protect our shores and our cities from attack, or to carry the fight to the enemy.

Next in importance is the whole problem of civil defense. This includes the tremendous task of coordinating and marshalling all our facilities for warning, evacuation, disaster control, and the care of distressed communities.

When the words, "civilian defense" are mentioned in any group of people, three reactions, are obtained.

The first is: "Oh, it can't happen here."

The second: "My God, why doesn't somebody do something!"

The third: "Well, we had a civil defense set-up during World War II, and we can do it again."

Let me say that none of those reactions shows evidence of a single brain cell working. The first is born of optimism; the second of pessimism, and the third of downright ignorance.

We must recognize that three elements in modern warfare did not exist during the last war. At that time the atomic bomb was found only in science fiction. At that time the intercontinental bomb-carrying aircraft was only on the drawing boards, and at that time there was no medium-range rocket-powered missile.

The combination of the three now would permit attack upon most of the major industrial centers of the United States, and certainly upon our coastal cities, with little or no warning. Even with the "radar fence" that the newspapers say is being built, we must realize that the speed of modern aircraft may give us no more than 15 minutes warning of an impending attack. So we must rule out the reaction, "It can't happen here." It could happen, and with little or no warning.

Let's consider another reaction: "We had a civil defense setup during World War II, and we can do it again." We all can remember our air raid alerts, the blackouts, the air raid warden posts. We can remember the sirens being sounded, the wardens grabbing their flashlights and whistles and tin helmets and dashing off to make sure not a gleam of light was visible.

Today Is Different

And on hilltops along the coast or atop buildings, watchers scanned the skies for enemy planes, ready to report by telephone to control centers. Atomic weapons when combined with modern high-speed aircraft make this type of warning system almost as outmoded as high button shoes.

What a difference there would be in an attack today! Let us suppose that an A-bomb was dropped dead center over this city. First, the explosion would have a tremendous blast effect, probably far greater than in Japan where the atomic bombs had the blasting power of 20,000 tons of TNT. The temperature after the explosion reaches more than 1,000,000 degrees centigrade and is thus a tremendous incendiary weapon, setting great fires in buildings and causing severe flash burns in human beings.

Then, as a secondary effect, many fires are started in outlying areas, by flying debris, overturned stoves, escaping gas. In addition to blast and incendiary effects the explosion gives off large amounts of radiation, both the short-lived but powerful gamma rays and the longer lived fission products.

The effect of radiation is so great that at a distance of 3,000 feet from the explosion the initial nuclear radiation would probably prove fatal to 50 per cent of human beings, even if protected by 12 inches of concrete. A large proportion of humans exposed to the initial gamma rays within 4,200 feet of an atomic explosion would die of radiation sickness.

At less than 2,100 feet from the explosion, physical and thermal destruction are so serious that in unprotected regions radiological injury does not need consideration. At 3,000 feet there would be virtually complete destruction of all buildings, other than those of heavily reinforced concrete design. At 6,000 feet electrical installations would be destroyed. At 10,000 feet

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THE AUTHOR: *Dr. W. R. G. Baker is Vice-President and Manager of the Electronics Department of General Electric Company. This article presents excerpts from a talk at the announcement of the Utica Communications Plant at Utica, N. Y., November 13, 1950.*

Static Electricity

Its Elimination by Bonding and Grounding

By G. M. KINTZ

SINCE the beginning of time static electricity has baffled and harmed man and beast. Even today there are few industries or homes where it cannot cause fire or explosion.

No one knows exactly how many fires or explosions have been caused by static electricity. From available information, it is estimated that each year 2,000 persons will be struck by lightning, a form of static electricity. Of these persons, approximately 400 will be killed and 1,600 injured.[1] Lightning will also cause at least $18,000,000 property damage, 9/10 of which will be on farms or in towns of less than 2,500 population.[2]

Lightning is only the spectacular phase of static electricity. Most of the fires and explosions will be caused by almost invisible static electrical sparks. Minute sparks have caused explosions and fires in hospital operating rooms, in the petroleum industry (including geophysical operations) chemical plants, powder plants, threshing machines, cotton gins, grain and flour mills, metal powder mills, mines, rice driers, and other places where flammable fluids and dusts are handled.

In the printing, radio, textile and photographic industries, static sparks cause considerable mechanical difficulty. Cattle men tell of stampedes caused when static sparks jumped between animals.

In biblical times people apparently knew how to guard against lightning. The sharp gold points on the roof of King Solomon's temple were connected to the ground by metal. However, knowledge of lightning control was lost until 1751 when Benjamin Franklin proved with his kite that lightning is not a form of witchcraft or the vengeance of angry gods.[3]

Other forms of electricity were also known to the ancients. About 600 B. C., Thales of Miletus observed that amber when rubbed with silk would attract bits of straw, lint, and other materials. Our word "electricity" comes from "elektron," Greek for amber.

G. M. Kintz (left) and H. F. Browne use miniature truck and tank to demonstrate the importance of grounding or bonding the truck to the tank. See Figure 3.

Kinds of Electricity

Electricity is generally described as being of three kinds:

1. *Static electricity*, usually said to be caused by friction but known to be generated by contact and separation of particles.

2. *Dynamic electricity*, either alternating or direct current, generated by a dynamo which causes magnetic lines of force to contact and separate.

3. *Galvanic electricity*, generated by a chemical reaction which causes a separation of particles often resulting in a change of state.

Demonstrations have proved that fire is created only when certain substances and conditions exist simultaneously.[4] The "fire triangle" proves that fire will occur only when fuel (generally in the form of a vapor), oxygen and heat are present. The fuel and oxygen must be present in definite

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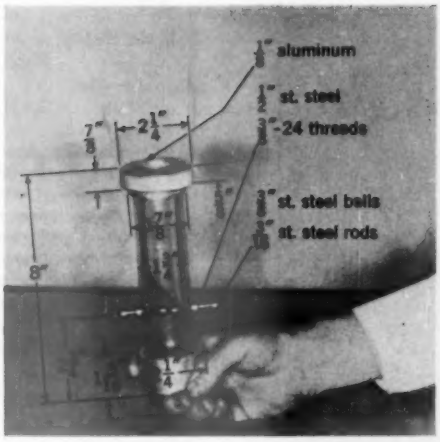

Figure 1. Explosion tube for experiments with mixtures of gasoline and air or oxygen.

Figure 2. Electrophorus composed of metal disk and lucite plate. Apparatus is used to generate static electricity by contact and separation.

quantities known as "flammable limits." Too little or too much fuel will not cause an explosion.

For ignition and flame propagation, the heat or source of ignition must have a minimum temperature and must remain at that temperature long enough to ignite not only the film of gas or flammable material adjacent to the heat source but also the next film. It is common knowledge that heat and electricity are energy. Therefore, static electricity can be the heat leg of the fire triangle.

Nearly everyone has felt a spark jump from his finger to a doorknob after he has walked across a thick carpet. Static electricity charges often accumulate on metal chairs and shock the occupant when he arises. When combing their hair, most people have seen or heard electrical sparks but never thought that they could start a fire or an explosion.

After a woman had rinsed her hair in gasoline, the sparks that occurred when she combed her hair ignited the fumes and she died from the burns. While a little girl was cleaning a grease spot off her doll's dress with flammable spot remover, her cat jumped upon the table and when she stroked the cat's fur, the sparks ignited the flammable fumes. The fire started by unseen sparks caused serious burns to the girl, also considerable property damage.

It is easy to demonstrate how electrical sparks ignite flammable mixtures by reproducing the fundamentals of this incident. One person holds the base of a specially constructed explosion tube. (Fig. 1), which is filled with a flammable mixture of oxygen and gasoline. A second person rubs a plastic rod with cat fur or a wool rag. When he touches the ungrounded tube terminal with the rod, a spark occurs between the inside ends of the terminals and causes an explosion.

Lightning flashes have been approximated at 100,000 volts per foot? In 1947 Dr. E. L. Herder of the Westinghouse Lightning Research Department measured five separate surges which struck the University of Pittsburgh's Cathedral of Learning. The amount of current in at least one of them was 345,000 amperes.

Rainstorms, duststorms, dry snowstorms, and thunderclouds often cause heavy charges of static electricity to accumulate on insulated metal bodies, such as automobiles, trucks, wire fences, sheet metal buildings, circuits for firing explosives, telephone lines, and radio antennas. Heavy charges are often found around waterfalls; this phenomenon is often observed in the bathroom shower of a home.

Flat, power transmission belts often generate and accumulate heavy static electrical charges. Dusts, fibers, wet gases, or steam flowing through ducts, into bins, holds of ships, or silos often generate enough electricity to cause sparks, which may ignite flamma-

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Figure 3. Miniature truck and miniature storage tank. Tank is constructed as a condenser and has gas tube through it so gas can be released at end of tank.

Automatic systems can combine the important elements of early detection of fire with prompt warning and quick application of the extinguishing agent. Where value of contents is high and subject to water damage, carbon dioxide systems are often used. (Walter Kidde & Co.)

WAKEFUL WATCHMEN

With a proven record of reliability, automatic detection devices enable fire fighters to use those vital "first five minutes"

By PAUL E. HUBBY

WITH ALL our scientific and technical advancement, and this includes fire protection, why have our over-all life and fire losses continued to increase, even though structural fire losses were six per cent lower in 1949 than in 1948?

Have we failed to keep pace with progress by not utilizing to the utmost the protective devices available to safeguard our lives and properties? Is it that we have not yet fully realized the value of procedures used in the "first five minutes" of fighting fire? Or have we merely failed to do much about them?

I refer specifically, and in the broadest terms, to automatic fire detection. It would seem that we have not put enough reliance in this excellent device. Since it was developed, its ability to detect abnormal heat and to sound an alarm has saved many thousands of dollars worth of property from destruction.

A recent analysis of fires throughout the country involving loss of life and heavy loss of property, made by the Nassau County, N. Y., Fire Commission, revealed that in a high percentage of the cases, the principal reasons for the losses were delayed discovery or delayed calling of the fire department. The two vital things were missing — a fire detection device and its complement, expedient use of the "first five minutes."

In view of the availability of numerous devices which automatically detect incipient fires and sound a warning, the commission urged that householders and merchants give serious thought to the installation of some such device.

What is the record of automatic fire detection reliability for the past two years? According to N.F.P.A. records of major property losses, where private fire detection and alarm systems were installed, and from information developed from other reliable sources, the facts show that in no

THE AUTHOR: *Paul E. Hubby is Assistant Chief Engineer, Improved Risk Mutuals, White Plains, N. Y. This paper has been condensed from a paper presented at the 38th National Safety Congress.*

instance did one of these systems fail to function at the time of the fire.

Further referring to the N.F.P.A. records for the past two years in properties where there were no automatic fire detection devices (but excluding those properties protected with automatic sprinklers), we find the following to be the facts.

Needless Losses

The two most serious fires, from the point of view of loss of life, were St. Anthony's Hospital catastrophe at Effingham, Illinois, in which 74 lives were needlessly destroyed, and the tragedy at St. Elizabeth's Mercy Hospital in Davenport, Iowa, in which 41 persons died.

In addition to these losses, the records show that there were approximately 175 other large fires involving various occupancies and operations where property losses might have been considerably lower, had they been protected with automatic fire detection systems and prompt fire fighting procedures.

N.F.P.A. records also show that there were five major property losses, involving over $5,000,000, in which the buildings were equipped with automatic fire detection systems. In each of these losses the fire detection and alarm equipment operated satisfactorily. Had not other circumstances entirely foreign to the alarm systems entered the picture, these losses would not have been so great.

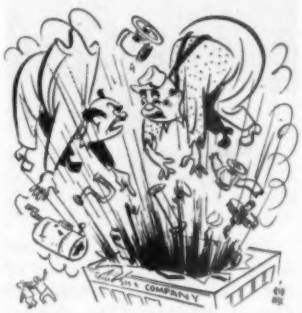
The losses point to failure, not on the part of the fire detection system, but to us humans for failing to anticipate proper protection for special hazards, training of employees in the use of first-aid fire fighting equipment, provision for quick building entrance for the fire fighters, and possible error in adjusting the fire fighting device.

There is every reason to believe if all of the 177 properties, mentioned as being involved in major fire losses in 1949, had been protected with automatic fire detection systems, and if all other factors had functioned efficiently, less damage would have resulted.

This assumption is evidenced by the fact that today insurance companies are placing more confidence in automatic fire alarm systems than in watchmen. In the very near future, it is quite possible a new nationwide schedule of rate credits will be announced for approved and properly installed fire detection systems that are connected directly to headquarters of a paid fire department.

Why weren't more of these valuable properties better protected? Is it because we in the fire prevention business failed to sell the owner the benefits such protection would provide? Could it be cost? This seems to be rather a weak argument, but could be quite a potent one when presented to a board of directors. However, when considering costs of maintaining watchman service today, as compared with a few years ago, and the improved protection fire detection systems now provided, the cost factor can be almost entirely discounted.

Much progress with automatic fire detection has been made. More property owners now are receptive to the added protection a fire detection device will give. More systems are being installed. More manufacturers of approved automatic fire detection devices and complete systems are in the field.



"What does this mean, Clapbottom . . . are you hinting for a new combustion safeguard installation?" (Courtesy Wheelco Instruments Co.)

During World War II, when it was vital to our success that material be promptly and safely delivered to our fighting men, many devices were developed to protect war material in transit, also manufacturing processes and storage facilities at home.

Two practical devices were designed at that time. One was finally approved in 1948, and is now protecting several valuable properties in the State of New York. The other is still in the development stage. It has been successfully tested by the U. S. Air Force and other government regulatory agencies for civil aviation, and it is now undergoing regular Underwriters' Laboratories tests for application in industry.

Because of our recent hotel and hospital life and fire losses, several state legislatures have passed laws in an attempt to prevent such tragedies in the future. In these laws there is a clause requiring installation of equipment to promptly detect fire and to sound an alarm of a fire in its incipient stage. Of course, these laws have provided the stimulant for manufacturers to develop and sell automatic fire detection equipment.

Electronic Devices

Previous to World War II most fire detection devices operated on the mechanical, pneumatic-electric, or the straight electric principle. As a definite result of research during the war, devices are now being developed based solely on electronics in one form or another in conjunction with spot type fixed temperature thermostats. They are much more sensitive than those of a few years ago and will detect and report a fire in a very few seconds.

Let us examine some new fire detection systems and devices that are available, and those still in the stage of development.

Foremost among the systems is one manufactured by Lord-Taber Company of Canadaigua, N. Y.

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DIARY OF AN INDUSTRIAL PHYSICIAN

By DR. H. P. DASTUR, L. M. & S.

I STARTED the morning work auspiciously. The post brought news of line clear for an experiment I wanted to try out. Then came Bhagi saying, "Thank you, sir, the child is better."

Thank the Lord, I said to myself. I had examined that baby a day before and was wondering where he was leading me. These little things have a way of playing treacherous tricks on doctors. But troubles soon started.

Pandoo was the next man in with his X-ray report, which said he had tuberculosis at both the apices. Like music deserting a broken reed, such a report invariably sucks away joy from work, and each time this eternal nightmare of my industrial career is before me, I wonder if I should pity the victim or myself more. If I ask him to quit work I ask him to die of tuberculosis plus starvation. If I let him work, I create more Pandoos with tuberculosis. As, however, something has to be done, I asked him to take at least six months' leave.

With folded hands and tears in his eyes he pleaded, that I should do no such thing. He had three children and they would die of starvation. I should give him good medicine, and if I did not have it in the factory dispensary he would buy it himself no matter what it may cost. He would spend anything to keep himself working.

I wished (as I often wish) that somebody would transport me at once to a place where there was no Pandoo and no factory. But wouldn't it be much better, if we all were transported to some place, where there is no tuberculosis? And that place can be even an industrial factory if only the state and the employer unite to fight the disease with a five-pronged campaign of B. C. G. vaccination, mass radiography, sanatoria, sickness compensation and sheltered workshops. The best part of such a campaign would be that it would bring in more money in the long run than what it would use up in the beginning.

* * *

Girdhari Bhaiya usually accosts me with an upcountry bhaiya's grace and courtesy. But today he had none of it for me. He would not even salaam me. He just gruffly went at me. "It is now full one month since I am taking treatment from you, and you have not done me a particle of good. I do not want your medicine. I want two months' leave. I will go to my village. My grandmother there will give me better medicine than you."

THE AUTHOR: *Dr. H. P. Dastur is Medical Officer, Department of Industrial Health, Tata Industries Limited, Bombay. These sketches of a doctor's work in a large Indian industry appeared originally in* Proceedings of the Society for the Study of Industrial Medicine, September, 1950.

Nothing suited me better, for it is just stupid and a scandalous waste of good money to drug a patient for ill health due to breathing and ingesting dangerous poisons without first removing him from the evil surroundings. I promised Girdhari to do my best. As he was going I overheard his companion telling him that I should be sent to a cattle pound as I looked more like a dilapidated old cow than doctor.

Girdhari, poor fellow, is suffering from anaemia due to absorption of poisonous dyes with which he has to work in an atmosphere of abnormal heat and humidity. I had no difficulty in sanctioning his leave. And if his grandmother's treatment will include milk and leafy vegetables she will definitely show better results than mine. But this brought Girdharis' departmental head flop on me. Said he, he was short of men just then and Girdhari was "a useful old trained hand." Would I please reconsider and at least postpone his leave? I again wished I was at Jericho. If, however, the employer would only install proper controls to make the poisons inaccessible to Girdhari, he would pull out his doctor from an absurd situation, save Girdhari from an avoidable illness, give his departmental head continuous services of an able-bodied trained worker, prevent his losses through meaningless drugging of Girdhari, and increase the company's profits.

Lord, Have Mercy!

Lord have mercy on me. That Ismail is there again. He always gives me a headache. "Do have some pity on me," he started. "How am I to feed my children if every month I have to stay away so often? Last week, too, I came to you, and after staying away for four days, I came to work again yesterday, and today this hell-fire has started again. Have you no

pity for us? Please do give me some good medicine."

And I cried out within myself, would that I could cure asthma even when its victim keeps swallowing and breathing cotton dust ad libitum. Observing a painful silence I just signed his paper for repetition of his mixture and sent him away. As he was going I heard him muttering — "He is a barber, not a doctor. However much you plead with him he just signs and sends you away and never talks a word. What do they care whether we live or die?"

What industrial medicine likes to sell to all concerned is that dust nuisance is far more expensive to factories than its prevention.

Sabotage in the Garden

I was in the compound. The shift was changing. Men were coming in. One of them, while passing a flower bed, uprooted a flower plant, whirled it round and round, threw it as far as he could, and then laughed a hearty laugh. A supervisor who was following him accosted me.

"Have you seen that? And it is such perverse people you want to pamper, and that is why they are growing more and more unmanageable. Nowadays there is no discipline left anywhere," he lamented.

I made no reply, for I knew that he is a die-hard who firmly believes that the only way of keeping such workmen on their good behavior is through a whip or a kick, and by discipline he generally means his word last.

Another supervisor, who likes to do a little thinking on his own was also there. He too thought it a senseless and indefensible act, and so I explained to him that there are not enough facilities for them for water, for both drinking and washing purposes. In fact, they have complained about this and we have made an excuse that we have several difficulties about increasing such a supply.

And yet he everyday sees the garden being watered through a big fat hose! Is it any wonder, then, that he develops a grudge against the flowering plant? Very probably through what looks like a pure act of vandalism he has given vent to his inner discontent, and feels that just for once at least he has got even with the management. Probabilities are that today he will work better.

But, of course, this is no permanent remedy of his discontent which will gather again in him, and when there is a surcharge he will be again wanting to give vent to it and such explosions, by their very nature, are always destructive.

This stupid action of his has only impressed me with the urgent need of studying his needs and feelings sympathetically. Mental pain is ever so much worse than bodily, and more responsible for strained management-labour relations than any other cause.

* * *

I was questioning a skilled workman who could talk English, de-

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Heads NSC Industrial Department

CHARLES F. ALEXANDER has been named manager of the Industrial Department of the National Safety Council, according to an announcement by Ned H. Dearborn, Council president.

Mr. Alexander has had extensive industrial experience in the fields of production, engineering, foreman training, and sales. He comes to the Council after five years with the Cherry-Burrell Corp., Chicago. His most recent position there was as assistant general manager of manufacturing where his duties include coordination of production methods and defense contracts.

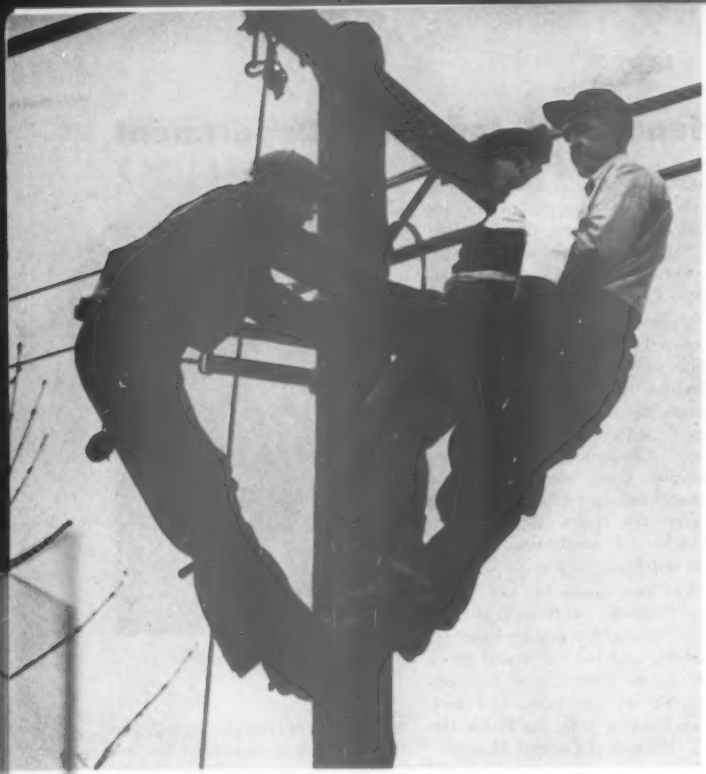
For two years he was senior staff engineer with George Frye and Associates, management engineers, and for ten years served in various positions in engineering, production, sales, and foreman training with the Buick Motor Division of General Motors.

"Mr. Alexander is exceptionally well fitted to take charge of the Council's industrial program in these critical times," said Mr. Dearborn. "His knowledge of industrial production methods, his extensive participation in foreman training programs, and his sales experience have given him a keen insight into the need for and methods of industrial safety.

"Although industry has led the way in safety, we recognize there are important segments of industry where accident prevention has received less attention than it deserves. We believe Mr. Alexander has the background, the knowledge, and the personality to head up the Council's program of activities aimed at further reducing accident losses among the workers of this country."

Charles F. Alexander

Mr. Alexander assumes his new duties February 1. A. M. Baltzer, assistant manager of the Industrial Department since 1946, continues in that position.



ELECTRICITY and the Human Body

When electric current flows through the body, the extent of the injury depends on several factors. Here is a comprehensive summary of the factors and effects

By W. B. KOUWENHOVEN

AS LIGHTNING, electricity has always been a cause of death. None of electricity's fatal properties were lost when man learned how to produce and control currents for his own use.

Until the eighteenth century no man-made shocks were recorded simply because man had no means of generating electricity. In 1746 two Dutch physicists accidentally discharged a Leyden jar through their bodies. Rumors accompanying their report intimate that fright inhibited them from repeating the experiment for the king.

Man-made electricity killed its first victim in 1879. Today in the United States and Canada it kills annually seven per million of the population. Approximately half of the reported accidents are fatal.

Factors

In order to consider the effects that electricity produces when it flows through the body, certain factors must be evaluated:

1. Type of circuit and its frequency.
2. Voltage of the circuit.
3. Resistance of the body.
4. The current that flows.
5. Pathway of the current through the tissues.
6. Duration of the contact.

Type of Circuit. Commercial electric circuits may be either direct or alternating current. If of the latter class they may vary in frequency. Contact with an electric circuit will in general cause a muscular contraction that is greater on alternating than on direct current circuits. Furthermore, low voltage direct current circuits are much less dangerous than alternating circuits of the same voltage.

Deaths on 120-volt direct current circuits are extremely rare. (There is only one on record where there was no possibility of a higher voltage surge taking place due to the interruption of the circuit.)

Alternating current frequencies, ranging from 10 to 300 cycles, produce almost identical effects on the human body. The curve of sensitivity to shock is very flat over this region.

Voltage. High-voltage circuits are universally recognized as hazardous. Low voltage circuits are also dangerous and fatalities have occurred on commercial frequency circuits at voltages as low as 46 volts.

Although alternating voltages of 24 volts are generally considered safe, they may be the indirect cause of a serious accident due to

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THE AUTHOR: *After receiving the degrees of E. E. and M. E. from Brooklyn Polytechnic Institute, Professor W. B. Kouwenhoven continued his scientific studies in Germany, receiving the degree of doktor ingenieur from Karlsruhe Technische Hochschule in 1913. Since 1913 he has been on the faculty of Johns Hopkins University, Baltimore, and since 1938 has been dean of the School of Electrical Engineering. He is internationally known as an authority on electricity, and is a contributor to many scientific publications. This article has been condensed from a paper presented at the 38th National Safety Congress.*

the involuntary musculature contraction that results from even low voltage shocks.

The small grain of wheat lamps that physicians sometimes introduce into human bodies are, in addition to being well insulated, usually only six-volt lamps.

Resistance of the Body—The resistance offered by the outer layer of skin, the epidermis, to the flow of electricity is the body's best protection against the hazards of electricity. The epidermis is horny, contains no blood vessels or nerves, and is a poor conductor. The inner skin or derma, on the other hand, is rich in blood capillaries and nerves and is a good conductor.

When the epidermis is dry, its resistance is high and in the case of the calloused palm of a worker may reach the value of 15,000 ohms per square inch. When thoroughly wet, due to moisture or perspiration, its resistance may fall to less than 1/100 of its dry value. Once the current penetrates the epidermis, resistance offered by the body to the flow of electricity is relatively low.

The skin resistance has many peculiar properties in addition to changing its resistance when wet. It increases during sleep[1], it is high on regions of the body that are paralyzed, and has other characteristics which are the subject of continuing study at the Johns Hopkins Hospital[2]. In addition, its resistance varies with the applied voltage. For example, measurements of the body resistance from hand to hand with 60 cycle alternating voltage gives the following values:

50 volts — 10,000 ohms
500 volts — 1,200 ohms
1,000 volts — 1,000 ohms

Measurements of body resistance with alternating currents show that normal men have a power of 0.1 at 10,000 cycles. Thus, the skin may be compared to a condenser with a poor dielectric. Formation of blisters is another property of the skin which increases the hazard of low-voltage shocks. When blisters are formed, the epidermis loses its protective high resistance. The heat produced by contact with a 120-volt circuit will form blisters within a few seconds.

Because of the marked lowering of the skin resistance by moisture, it is of prime importance that extra precautions be taken to protect workers using electric equipment in damp locations.

Current. The current that flows through the body when contact is made with an electrical circuit is determined by Ohm's law which states that the current in amperes equals the applied volts divided by the resistance of the circuit in ohms. It is the electric current that flows through the body which determines to a large extent the resultant injury. The effects produced by various values of current will be considered later.

Pathway Through the Body. The path that the current follows in flowing through the body is of prime importance in determining the resultant injury. In general, if there are no vital organs in its path, the resulting injury is negligible or confined to burns.

For example,[3,4] rats under complete anesthesia were subjected to a two-second, 60 cycle, 220 volt shock. When the current pathway was from foreleg to foreleg, all died; from hind leg to hind leg, all lived. It is, however, possible that cases of severe surgical shock may result from contact with the circuit at two points on the same extremity.

Duration. The duration of any contact with an electrical circuit is important. The longer the time of contact, the less are the chances of recovery.

Current Effects

The voltage of commercial electric circuits range from the 120-volt house circuit to several hundred thousand volts on transmission lines. The amount of current that will flow through a victim when he makes contact with an electric circuit equals the voltage of that circuit divided by the resistance in accordance with Ohm's law. Therefore, the current may vary from less than one milliampere (1/1,000 of an ampeere) to values far in excess of one ampere.

To facilitate study of the effects of this wide range of current values, they have been grouped in eight classifications:

1. Threshold of feeling.
2. Let-go current.
3. Freezing current.
4. Current which an individual can withstand without being rendered unconscious.
5. Fibrillation current.
6. Nerve-blocking current.
7. Countershock current.
8. Excessive currents.

Threshold of Feeling. A 60-cycle alternating current of one milliampere will in general produce a tingling or prickling sensation at the point of contact. This current value varies with the individual and also with the frequency.

Dalziel[5] and others[6] have made studies of sensation currents. Dal-

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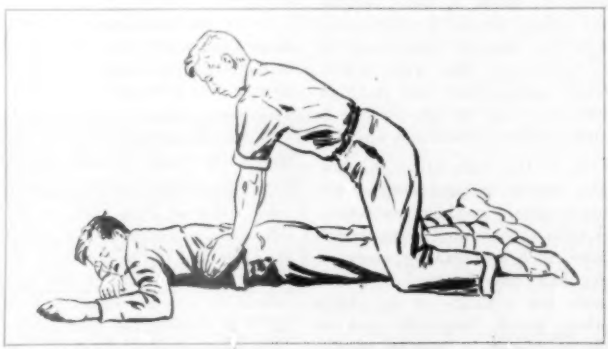

Prompt application of the prone pressure method of resuscitation has saved the lives of many victims of electric shock.

COLOR IN INDUSTRY

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1. Effective use of suitably colored paints for equipment and for the interiors of industrial buildings increases the safety, efficiency, and morale of workers. Proper application of paint of suitable type and color serves the following specific purposes:

a. Improves visibility.
b. Uses light efficiently and economically.
c. Promotes safety and efficiency.
d. Provides pleasant and restful surroundings.
e. Identifies fire equipment, hazards, safety instructions, etc.

Wall and Ceiling Colors

2. Visibility is best when light is sufficient and uniform throughout a work area. The source of illumination may furnish ample light, but if an excessive amount of light is absorbed by dark surfaces, visibility is inadequate for accurate workmanship.

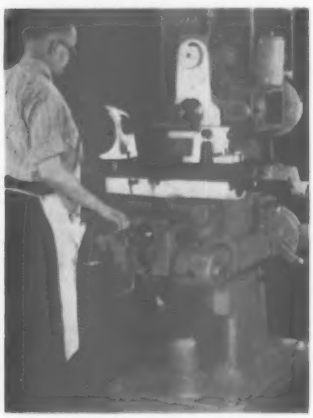

Figure 1. Milling machine painted in spotlight green and horizon gray illustrates how color emphasizes danger points of working areas and supplements mechanical guarding. (Courtesy E. I. du Pont de Nemours and Company)

This Data Sheet is one of a series published by National Safety Council. It is a compilation of experience from many sources. It should not be assumed that it includes every acceptable procedure in its field. It must not be confused with American Standard Safety codes; federal laws; insurance requirements; state laws, rules and regulations, and municipal ordinances. *Announcement will be made when reprints of this Data Sheet are available.*

3. On the other hand, light-colored surfaces may reflect too much light and produce glare, distractions, and fatigue. One of the principal causes of eyestrain and inaccuracies in work is the continual adjustment of the lenses of the eyes required by sharp contrasts of bright and dark areas in working places.

4. Use of white paint on ceilings is recommended as a fundamental step in obtaining uniform light and in utilizing it efficiently, especially if the lighting system is indirect. White is most suitable for ceilings because it reflects more light than does any other color, 80 to 88 per cent. Also, white is relatively unattractive, and its high reflectance has no adverse effects since workers seldom look upward.

5. If the walls are high, they also may be painted white at the top to obtain maximum reflection. A color of somewhat lower reflectance, such as cream or ivory or sky blue, may be used in rooms with low ceilings or in places where people frequently look at the ceiling as in hospital rooms. To give ceilings the effect of receding, some plant departments with direct lighting use a color of high reflectance on low ceilings or ceilings consisting of a network of girders and equipment.

6. Research by the New Jersey Zinc Company shows that reflection values of various paints are, white, 88 per cent; cream, 69 per cent; ivory, 67 per cent; sky blue, 65 per cent; pale green, 59 per cent; buff, 52 per cent; and aluminum, 41 per cent.

7. The brightness of wall areas in the normal range of vision of workers should not exceed the brightness of the working area, to prevent fatigue due to distractions and to continual adaptation of the eye. Colors having reflectance values of 50 to 60 per cent are recommended for walls directly in line with the workers' eyes.

8. Soft shades, such as light gray, pale green, and light blue, are suitable for sections of walls in the range of vision of employees. For example, a soft gray hue is not distracting, conceals dust, and is restful to the eyes.

9. If the temperature of the room tends to be above normal, a blue-green is particularly desirable because it is a "cool" color. Brilliant colors, like too much brightness, are distracting and are not used on the walls of work places.

10. End walls may be painted a color different from that on the side walls, especially where rooms are large and the workers are engaged in close work. A soft tint relaxes the eyes when workers look up; it is pleasing and does not require constriction of the pupil. For example, a soft tone of blue-green

on the side walls with a soft yellow on the end walls is a good combination.

11. The purpose of a dado is to conceal stains, marks, and soil on the lower walls and, if used, it extends to the height of the machines or work benches or about one-third the height of the wall. A stripe between the dado and the upper wall is unnecessary. The dado may be the same color as the upper wall but a darker shade, reflecting only 25 to 40 per cent of the light.

Colors for Machines

12. If possible, floors should have a reflectance factor of at least 25 per cent, and the reflectance of machines, materials, desks, and similar equipment should vary between 25 and 40 per cent. If the work is light and the surrounding area is dark, the pupil of the eye opens so wide that blurs and afterimages are caused.

13. Likewise, the surroundings should not be too bright if the work is dark. When this condition exists, the pupil opening is small and the eye strains in order to see clearly. Severe eyestrain also develops from looking at dark work against a dark background.

14. Supplementary lighting may be necessary where employees work with dark materials. Light materials may be seen clearly without strain if the surrounding area is a trifle lower in brightness. Shields or targets of the proper brightness may be used at machines or in other localized areas.

15. In one case the task of looping fine threads on a series of needles involved difficult seeing against a background of space and of distractions due to the movement of other workers. Screens, painted a light grayish blue, placed in the space reduced the contrast and eliminated the need for frequent adjustments of the eyes.

Figure 3. One of the many decalcomanias available from the National Safety Council. These decals conform to the American Standards Association's code on accident prevention signs.

Figure 2. Painting bumper guards on pusher slab at hot mill to increase visibility. (Courtesy Western Cartridge Company)

16. Contrasting colors of proper reflectance values are most suitable for machines. (See Figure 1.) Four shades of gray, ranging from light to dark, are standard colors for machines. The critical parts should stand out in cream, light tan, and other light contrasting colors.

17. Orange has special attention value and has been used to highlight open guards and hazardous parts of machines and electrical equipment. For good visibility, the color of parts involved in the placement, measurement, and inspection of the work should contrast with that of the material.

Psychology of Colors

18. Workers respond psychologically and esthetically to properly painted walls and equipment. The general reactions to familiar colors are these:

a. *Yellow* tints have a cheering and stimulating effect.

b. *Blue* is a cool color and therefore may be used effectively where temperatures may be above normal.

c. *Green* has the effects of blue and yellow and is restful to the eyes. A blue-green, like blue, gives a sensation of coolness whereas a yellow-green has more warmth.

d. *Orange*, made from red and yellow, is a bright color, and only tints should be used. It produces the effect of warmth.

e. *Red* suggests danger and excitement.

f. *Violet* and *purple* are rich colors and imply luxury.

19. Selection of a type of paint depends considerably on where the paint is to be used. Flat paint is most suitable for ceilings and upper walls because it diffuses light better and reduces glare. Ease in cleaning and durability are important points in the selection of paint for dadoes and equipment, and a gloss or semi-gloss is generally recommended.

20. Locker rooms, rest rooms, and other facilities may be painted in colors that particularly appeal to people. Men like "cool" colors, such as blue. Women, on the other hand, mostly prefer warm tones, like rose.

21. Cafeterias frequented by both sexes may be painted peach, which is a popular hue and par-

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In Business for

The profits from a plant cafeteria come

PREPARING THE MENU. Stanley Smith (left), coordinator of food services for The Champion Paper & Fibre Company at Hamilton, Ohio, and Bill Wright, supervisor of food services, plan menus for the cafeteria for a 24-hour period. They are still able to smile in spite of rising prices.

THERE'S nothing like a well-cooked, well-balanced lunch to make the afternoon's work seem easier. Many a company found that out during World War II when rationing and inconvenient shopping hours were troubling many households.

On the basis of cash income versus outgo, operating a plant cafeteria is one of the least profitable of business ventures. Most companies providing food on the premises would be happy if they broke even on the project. But they realize that providing tasty, nourishing meals helps employees to do better work and be better satisfied with the job.

The Champion Paper Company, with plants at Hamilton, Ohio, Canton, North Carolina, and Houston, Texas, is convinced that a well-run cafeteria program pays dividends in workers who are better equipped to fulfill their jobs.

Last year with gross cafeteria sales of nearly $600,000 in the three plants, the enterprise went into the red to the extent of $90,000. Although within the next few years Champion hopes to gear its operations so that they will come closer to the "break even" point, the health and well being of employees is the first consideration.

In the face of increasing costs, the cafeterias are striving to operate more efficiently and economically. Considering the quantities of the various foods purchased, it can be seen that even a small increase in individual items could cause a substantial increase in the total deficit.

NO GREASY SPOONS. The dishwashing machine, using strong detergents and water too hot for human hands, insures clean tableware in cafeteria.

A PICK-UP SNACK at the canteen provides a welcome lift during the mid-afternoon period. Hot and cold drinks, sandwiches, ice cream and candy, are consumed in large quantities by plant employees.

Their Health...

in the increased well-being of employees

FIGURING THE COSTS. A man with many headaches is Earl Braun, Hamilton Cafeteria's cost clerk. He processes the bills and figures the deficits.

In a recent typical month, the cafeteria system required 17,000 pounds (some 8½ tons) of meat. Other foods consumed included such amounts as 133,000 cups of coffee, 25,000 pints of milk, 46,000 rolls and buns, 85,000 slices of bread and corn bread, as well as large quantities of vegetables, fruit, pastry, candy, and other items.

Ordering the food alone is a headache, as indicated by the previous list of items. Markets must be watched to buy as economically as possible, and to check the quality of supplies.

Actually, however, purchasing is only a small part of cafeteria work. Of even greater proportion are the menu planning, cold storage of perishable foods, cooking and baking, serving and dishwashing, and distribution through the widely scattered canteens. And day in and day out, there can be no relaxation of efforts to secure complete cleanliness.

A CLEAN KITCHEN is a must. Here is a view of Canton's modern facilities. Frequent other bakery products for workers' lunches and snacks.

LEFT: A wide variety of salads is being arranged for lunch at the Hamilton cafeteria. RIGHT: At Canton, a complete bakery turns out monthly 2,100 dozen doughnuts, 1,800 pies and other bakery products for workers' lunches and snacks.

CAUSE AND CURE

These examples are from reports of actual accidents. They list the causes and the steps taken to prevent recurrence

False Start

Engine helper was assisting in barring around flywheel of oil engine, as piston passed center and wheel spun forward, throwing worker off balance.

Correction: Workers were reinstructed in safe way to start internal combustion engines, and were warned to brace feet to keep balance when turning wheels of heavy engines.

Strong Man

Employee tried to move 300-pound steel plate from vertical position onto four-wheel swivel truck, which swung around, and plate crushed his toe.

Correction: Campaign was started to get all workers in department to wear safety shoes; they were warned to secure free-moving trucks when loading, and to get help on heavy loads.

Tenderfoot

As lineman was chopping down tree on right-of-way for power line, axe glanced from cut and pierced shoe of left foot, cutting tendon in arch.

Correction: Foreman was told that he must not assume that linemen, experienced in underground work, would know how to use axe properly, but must give new men specific instruction.

Help Needed

Pipefitter pried with lever to lift flange of heavy piece of pipe over stationary pipe; weight dropped on other side, throwing lever and thumb against valve wheel.

Correction: Workmen were warned, first of all, to get help in handling heavy pipe, and to block up on side where weight will drop suddenly, if one must work alone.

Unguarded Moment

Welder's helper removed his tinted goggles to handle material, suffering arc burn when welder struck arc before he could replace eye protection.

Correction: Workers were instructed to work out system of signals to warn helpers in plenty of time to cover eyes when arc is to be struck, if goggles have been removed.

Greasy Hands

Millwright and helper were setting machine with help of heavy straightedge when grease on hands allowed bar to slip and crush helper's toes.

Correction: All shop employees were told to keep plenty of clean wiping rags handy and to make sure grease and oil are removed from hands and tools before using.

Behind the Glass Door

First-aid rooms have hazards common to hospitals. So include the dispensary in your safety program

HOW safe is your first-aid room? Have your plant injuries ever been compounded by mishaps in your own hospital? Have your nurses, doctors or first-aid people ever had to take any of their own "medicine"?

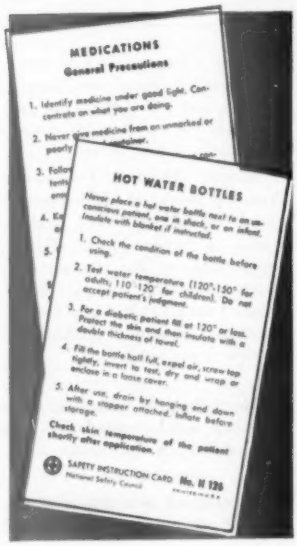
Those things are possible. In fact, if your plant hospital averages the same injury frequency rate as most general hospitals, you may have as much hazard behind the glass door as in front of it.

A recent study of the hospitals subscribing to the Hospital Safety Service of the National Safety Council turned up a lost-time frequency rate a shade higher than the average for all industries reported in the 1950 edition of Accident Facts. The average frequency for the group was 10.19, as compared with 10.14 for the Council's all-industry average. That nightmare of all hospital administrators, the hospital-caused injury to patients, is not included in those figures.

These most recent figures were based on approximately 50,000,000 man-hours of exposure. It is the third such study within the past 18 months, and each time the man-hour basis for calculation has been broadened, the rate has gone up.

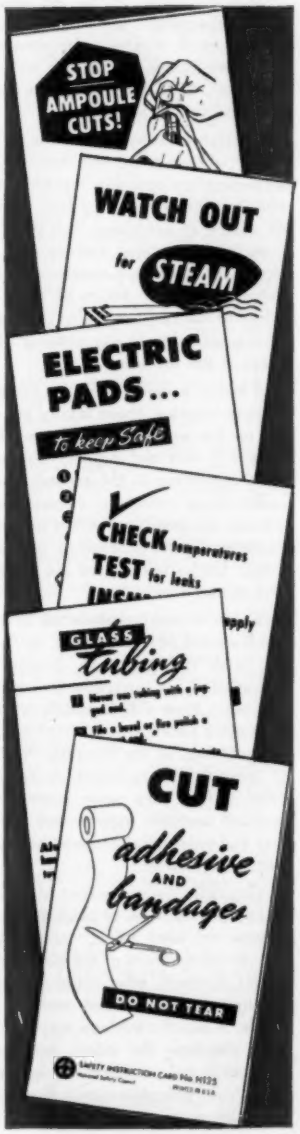
The severity picture for the reporting hospitals is low, estimated at .25. Because there were a good many cases still disabled at the time of reporting, without estimate of probable disability reported, the actual severity is probably much higher.

Causes of injury in hospitals—and presumably in industrial medical departments as well, unless special precautions are taken—are much the same as they are in general industrial operations. Twenty-four per cent of the total of 604 disabling injuries were caused by walkway surfaces. Hot objects and liquids, sharp objects, and acts of


MEDICATIONS
General Precautions
1. Identify medicine under good light. Concentrate on what you are doing.
HOT WATER BOTTLES
Never place a hot water bottle next to an unconscious patient, one in shock, or an infant. Insulate with blanket if instructed.
1. Check the condition of the bottle before using.
2. Test water temperature (120°-150° for adults; 110-120 for children). Do not accept patient's judgment.
3. For a diabetic patient fill at 120° or less. Protect the skin and then insulate with a double thickness of towel.
4. Fill the bottle half full, expel air, screw top tightly, invert to test, dry and wrap or enclose in a loose cover.
5. After use, drain by hanging end down with a stopper attached. Inflate before storage.
Check skin temperature of the patient shortly after application.
SAFETY INSTRUCTION CARD No. H 126

This type of card, following standard instruction card patterns, summarizes precautions on nursing and other service.

These poster-type cards are used as training materials. Each is blown up into "A" size posters for distribution with the Hospital Safety Service.



persons accounted for 8½ per cent each. The "acts of persons" problem is not one which the industrial manager has to face, as the bulk of such injuries were caused by persons under the influence of drugs, coming out of ether, or disturbed patients in mental hospitals.

Falls accounted for 31 per cent of the hospitals' lost-time cases, sprains and strains (frequently from attempting to lift or assist patients), 22 per cent, and burns and cuts for 27 per cent.

General observation of the reports submitted by the hospitals turned up an amazing number of minor injuries from contact with or misuse of autoclaves and sterilizers, both little ones and big ones. Hospitals have apparently never demanded proper design or installation of such equipment to protect even passers-by, to say nothing of users of the machines.

A heavy proportion of the more serious injuries, those laying people up for weeks or months, were caused by wet and slippery floors. And, according to the record, hot coffee is a common menace to nurses. It constitutes almost an occupational hazard, resulting not in major burns, but in first-aid cases and minor disability.

To do something about all this, the National Safety Council, working with the American Hospital Association, is currently furnishing more than 700 hospitals with a monthly package of service materials, known as the Hospital Safety Service. These materials comprise a four-page news letter on hospital hazards, appropriate posters and especially designed safety instruction cards.

Through the courtesy of the AHA, this Service is available to anyone in need of it, including industrial members of the National Safety Council, who could use it in their first-aid rooms and hospitals. Council members may likewise purchase the safety instruction cards and posters from regular stock. A complete sampling is available on request.

Looks Like Crossing the Styx

The gloomy setting of this picture does suggest the Stygian regions but the men in the boat are just members of the rescue corps of Acadia Coal Company, Limited, Stellarton, Nova Scotia. They are using the boat for practicing underground rescue operations.

The seven-foot plywood craft, named the *Flying Saucer*, is designed for loading on a shaft cage and to carry five men and equipment weighing a total of 1,096 pounds. It was recently lowered 1,200 feet in the mine after an explosion and used as a ferry to levels in the flooded bottom. Equipment includes two-hour breathing apparatus and electric cap lamps.

New Record for Steel Industry

The all-time safety record in the American steel industry was surpassed December 13 when Ellwood Works of U. S. Steel's National Tube Company reached 5,609,891 manhours of work without a disability.

The plant's 3300 employees have been on the job 318 days since anyone was kept from his job due to an accident at work.

Best safety record previous to this in the steel mills of the nation was a total of 5,598,367 manhours at the Pueblo, Col., plant of Colorado Fuel and Iron Corporation, according to National Safety Council records.

A workman suffered a broken toe from a falling piece of steel at the Ellwood plant last January 29. He was off work two days. That was the last time there was a lost-time accident there.

Another National Tube plant, National Works at McKeesport, is listed in steel's "Safety Hall of Fame," a National Safety Council recognition of the top six steel plants in safety. National Works chalked up 4,494,404 accident-free manhours before a mishap kept anyone from work.

About the only thing that seems to come down nowadays is the rain, and even that soaks you.

A pessimist is a guy who sizes himself up and gets sore about it.

The Safety Valve

The one world I ever knew or cared about appears to be demolishing itself upon loud moral principles; and my one certainty as concerns the future is that I shall not very much like it.

James Branch Cabell:
"Let Me Lie."

* * *

"Pay to the Order of . . ."

Those are welcome words in front of your name. Each year people in the U. S. issue more than 10 billion of these pieces of negotiable paper. The amount in dollars is well over a trillion — a figure beyond the imagination of most of us.

Handling all this paper means a lot of man-hours for the bank personnel. Every check must be handled and rehandled many times before it gets back to the maker, and this costs money. In a recent issue of *Standardization*, ASA's magazine, a New York banker makes a plea for simplification and standardization.

The check has become a medium for advertising as well as an instrument of payment. Trademarks, slogans, pictures of products, street addresses, payroll deductions, voucher data, restrictive clauses as to date and amount all clutter it up.

These, the bankers say, slow down the handling and recording of essential factors—date amount, drawer, drawee, and routing symbol.

If checks were all the same size and texture and the essential data were in identical spots on each check, mechanical fingers and electronic eyes and brains would take over many chores done by tellers and bookkeepers.

That ought to solve some of the bank's problems, but it can't tell whether a check is covered by sufficient funds. And it won't do away with the monthly job of reconciling the stubs with the bank's statement.

Self-Confidence

The late Grover Cleveland Alexander was one of baseball's immortals. In more than twenty years of pitching he had a high record of games won and a low earned run average. Off the field, his deportment wasn't always exemplary but Old Pete had a few rugged virtues.

He was a horse for work and he took the breaks of the game philosophically. He would pitch double headers when the other fellows had sore arms, and he didn't blame losses on the umpire or butter-fingered infielders. When the going was tough he didn't lose his nerve.

During his career many a press-agented rookie came up from the bushes but faded out after a season or two. Many of them had plenty of stuff, but they didn't last. Walter Johnson once classified pitchers as winning pitchers, pitchers, and just throwers. It takes heart and head as well as a strong arm.

When asked by a sports writer if he ever got nervous, Alex replied:

"Naw. I always figured I was a better pitcher than he was a batter. Of course, sometimes I wasn't, but it didn't hurt me to think so."

A philosophy like that will carry you through many a tight spot.

* * *

Technological changes do bring complications. Now that everybody in our block burns gas or oil, it isn't easy to find a bucket of ashes to spread over slippery sidewalks and driveways.

In This Issue . . .

VISITING a new plant can be exciting, particularly one as unusual as the new research and development tower at the S. C. Johnson plant in Racine, Wis. Here in an unbelievable 15-story tower with walls of Pyrex glass tubing is a laboratory where company technicians do research work and check the quality of current production.

One thing that amazes the visitor is that there is no foundation under the walls. Each floor is supported by cantilevers extending from a central shaft like branches from the trunk of a tree.

Light, ventilation, exits, fire protection, and other basic safety features are well taken care of, but the company feels that safety doesn't stop there. Surroundings should be attractive, too.

Having always had a stubborn fondness for the traditional, I used to think Frank Lloyd Wright's buildings were somewhat eccentric. But after a trip through the tower and the adjoining administration building, also designed by Wright, I shed a lot of former ideas. The layout was fascinating, and thoroughly practical. Dr. J. Vernon Steinle, Johnson's research head, and his associates who worked with the dictatorial architect, knew what they wanted. (Page 18).

* * *

The editors would rather devote these pages to subjects more pleasant than atomic bombs, but the problems cannot be ignored. Dr. W. R. G. Baker makes a strong plea for more civilian defense planning at the community level and less waiting for federal aid. (Page 23).

* * *

In the January issue, Bill Andrews' safety engineer was in one of his periodic predicaments. He had sent his assistant to a branch plant to carry out a few chores and the kid inadvertently stepped on a few toes. So the safety engineer intimated that he'd like a few suggestions from readers in getting the chap straightened out. The gratifying response indicates this phase of the problem is one of serious concern to safety men. (Page 46).

* * *

Another diary is included in this issue—that of an industrial physician in Bombay. Dr. H. P. Dastur is medical director for Tata Industries, Limited, one of India's largest industrial concerns. He reports his daily experiences with a gentle humor and a very keen sympathy for human troubles. (Page 28).

Carman Fish

Program Cuts Injuries to New York City Employees

Coordinators of New York City Departments conclude advanced training course in safety for city employees. Alfred R. Lateiner is the instructor.

AS a result of the accident control program inaugurated by the City of New York, the combined accident frequency rate of the Department of Sanitation and the Office of the Borough President of Manhattan has been reduced from 36 to 20.8.

The program is administered by the office of Budget Director Thomas J. Patterson. It is supervised by Abraham D. Beame, assistant budget director, while the actual safety training of employees is under the direction of Alfred R. Lateiner of City College.

Backing the program is a city-wide coordinating committee headed by Inspector Matthew Skea in charge of the Safety Bureau of the Police Department. Vice-president is Solomon Levi, of the Brooklyn Borough President's Office, and the secretary William Vincent of the Department of Water Supply, Gas and Electricity. George H. Straub, an engineer in the Office of the Budget Director, is executive secretary.

The safety program starts with a training course for supervisors. A five-day course is given periodically to coordinators, including advanced courses. Each of the coordinators conducts a five-hour course for coordinators in his own department. Supervisors in all departments of the city's government total 16,000.

One of the advanced courses, held in the Department of Water Supply, Gas and Electricity for coordinators from various city departments was recently completed under the direction of Mr. Lateiner.

The program, which has been in effect since January 1, 1948, was instituted by ex-Mayor William O'Dwyer. At first it was applied to five departments — Police, Fire, Sanitation, Public Works, and Correction. Then six more were added, then another ten. Now 21 departments, representing 95 per cent of the city's 160,000 employees, are covered. The remaining five per cent will be included early in 1951.

Analysis of accident causes reveals 21 unsafe practices and conditions which have been responsible for a large proportion of the injury cases. Conspicuous among these are wrong methods of lifting and unsafe loading.

Considerable attention is being given to correct methods of lifting, which is important for sanitation men and laborers and for highway workers generally. At the courses, diagrams are drawn on blackboards and demonstrations given of ways of lifting with minimum effort.

As the program grows, employee application is expected to be even wider. Some of the best safety ideas have come from employees and an organized suggestion system is being planned.

One of the improvements effected was the elimination of roadblock type barricades where a street or main was being repaired. These barricades proved mental hazards to some truck drivers. The plan of the Consolidated Edison Company of using stanchions with connecting tape has been adopted.

Trucks in which men and material were formerly put indiscriminately now have bench seats. Feet are less subject to injury and the men do not fall off the trucks.

Use of goggles and safety shoes is being promoted and their use is growing.

Wherever working conditions are inherently dangerous, the necessary precautions are stressed at every opportunity.

On one occasion when a contractor covered a manhole with asphalt, a city employee removed the asphalt to get into the sewer. He was overcome by sewer gas. He died and so did a fellow worker who tried to rescue him. A policeman who tried to save both was overcome but escaped with his life.

A man working at an incinerator plant of the Department of Sanitation was wearing his safety belt but hadn't clipped it to the overhead wire which would have prevented him from falling in. He fell onto a load of garbage which was being carried down the open chute.

He barely managed to crawl to a position where fellow workers pulled him out before he reached the furnace.

Proper job training, establishment of standard safe practices for hazardous operations, and the increasing use of protective equipment is making such occurrences less frequent.

Reasons Why

THE *Finnell* DRY SCRUBBER CLEANS FASTER... More Thoroughly

A unique combination of labor-saving features is responsible for the greater speed and thoroughness with which the *Finnell* Dry Scrubber cleans grease-caked floors.

Equipped with two powerful scarifying brushes, this *Finnell* digs through and quickly loosens the most stubborn coatings of dirt, oil, grease, and shavings—as the special couplings adjust brushes to floor irregularities, to get into indentations and grooves that rigid coupling brushes would pass over and miss.

To re-sharpen the brushes of the *Finnell* Dry Scrubber, simply *flip the switch.* That reverses the motion of the brushes and re-sharpens them *automatically* . . . while working. Eliminates the need for frequent changing of brushes by hand in order to maintain a good cutting edge.

Low construction makes it easy to clean around and beneath equipment, and the adjustable handle adapts the machine to operator's height for most effective working position.

Various types and sizes of wire scarifying brushes are interchangeable in the brush rings of this *Finnell* and, with other brush rings, the machine can be used for wet scrubbing, steel-wooling, waxing, and polishing. Ruggedly constructed. Has heavy duty G. E. Motor, oversize Timken Roller Bearings, special bronze worm gears, leak-proof gear case.

For consultation, demonstration, or literature, phone or write nearest *Finnell Branch* or Finnell System, Inc., 2202 East St., Elkhart, Ind. Branch Offices in all principal cities of the United States and Canada.

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FLOOR-MAINTENANCE EQUIPMENT AND SUPPLIES

BRANCHES IN ALL PRINCIPAL CITIES

Part of the Contract

CONSTRUCTION of a multi-million dollar flood control project with a minimum of accidents is one of the current objectives of the Corps of Engineers.

Last October the Grapevine Dam and Reservoir project, under construction about twenty miles northwest of Dallas, Texas, reported a record of only three minor injuries during the 2½ years the project had been under way.

With the work nearly half completed on this 13,500,000 project, the score stood at 639,223 man-hours without a major injury or a fatality, according to Colonel Delbert B. Freeman, Fort Worth District Engineer, under whose direction the project is being constructed.

At present, two major contracts are in force at the Grapevine project: a contract with Russ Mitchell, Inc., and Wyche Bruce Construction Company for the construction of outlet works and spillway and a contract with T. L. James & Co., Inc., and Guilliams Brothers for completion of the 12,850 foot-long earth embankment.

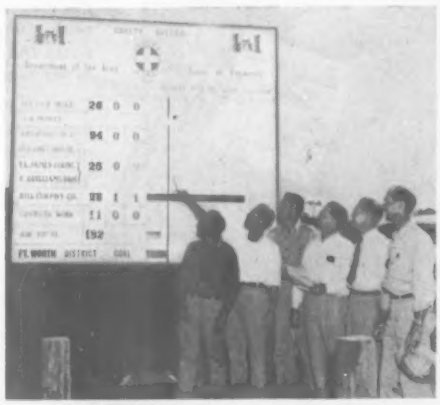
The contractors, working a total of 287,914 man-hours, operated without accident.

To promote safe construction practices the Corps of Engineers conducts monthly safety councils at the Grapevine project. Here construction problems and safety measures are discussed. Then follow contractors safety meetings with foremen and construction personnel.

In addition, Project Engineer John J. Russell, and John Agnew, field engineer, work closely with all construction crews who are safety conscious and extremely proud of their safety record.

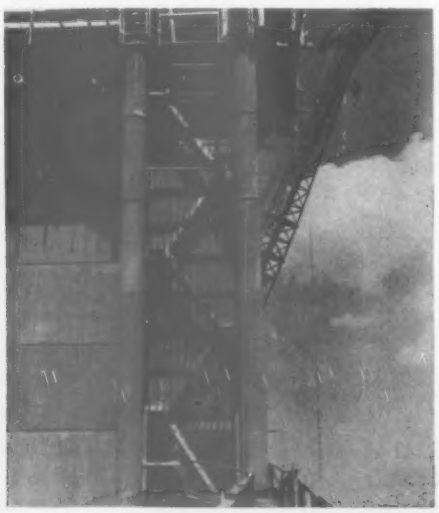
"We are using the grass roots

—*To page 108*



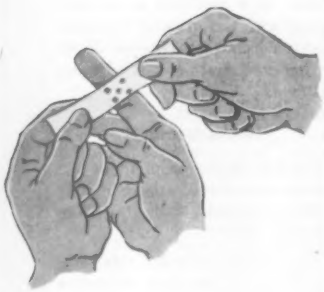
Reviewing the safety record for the Grapevine project are contractors and government personnel. Left to right: Price P. McLemore, superintendent for T. L. James & Co. and Guilliams Bros.; John J. Russell, project engineer, U. S. Corps of Engineers; Joe K. Gallimore, superintendent, Russ Mitchell, Inc., and Wyche and Bruce Construction Co.; H. B. Bruce, co-partner of same companies; H. H. Jensen, safety engineer, Fort Worth District, U. S. Engineers; John Agnew, project field engineer, U. S. Engineers.

Lower left: Construction of control tower. Stairway is guarded by trash racks. Cleated ramps with hand rails provide access to the tower.



Lower right: Wherever possible, stairways are used instead of ladders in construction work.

for industrial *First Aid*



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Do not neglect wounds, however small; even scratches and small cuts may become infected if they are not promptly and properly treated.

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The 2% aqueous solution is not irritating or toxic in wounds; minor injuries are reported more promptly when 'Mercurochrome' is the routine antiseptic, because treatment is not painful.

'Mercurochrome' solution keeps indefinitely; the color shows where it has been applied.

Physicians have used 'Mercurochrome' for more than 28 years.

Be sure to include 'Mercurochrome' in your first aid supplies.

*Reg. U. S. Pat. Off.

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BALTIMORE, MARYLAND

THE ACCIDENT BAROMETER

Prepared by the Statistical Division, National Safety Council

Accidental deaths in October totalled approximately 7,700, an increase of 100 fatalities over October, 1949. Most of the increase occurred in deaths from motor-vehicle accidents, but fatalities from occupational accidents also increased.

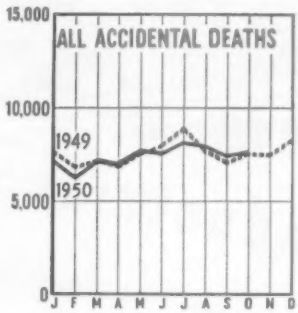
The total for the ten months was 73,800, a reduction of 2 per cent from the 1949 comparable total of 75,300. Sizable reductions in deaths from home and public non-motor-vehicle accidents were partially offset by a large increase in motor-vehicle fatalities and a small increase in deaths from occupational accidents.

Motor-Vehicle Deaths

The October total of motor-vehicle deaths was 3,440, an increase of 12 per cent over October, 1949. Compared to 1948, it was an increase of 7 per cent.

Deaths for the ten months totalled 28,020, an increase of 11 per cent from the 1949 total of 25,310. The ten-month death rate per 100,000,000 vehicle miles was 7.0, the same as in 1949.

Of the 44 states reporting for ten months, 7 had fewer deaths than in 1949, 1 showed no change, and 36 had more deaths. Reporting cities with populations over 10,000 showed a decrease of 3 per cent for October and an increase of 6 per cent for the ten months.



	1950	*1949*	*Change*
October	7,700	7,600	+1%
Ten Months..	73,800	75,300	—2%

Regional changes from 1949 in the ten-month death totals were:

North Atlantic	+ 4%
South Atlantic	+18%
North Central	+ 7%
South Central	+17%
Mountain	+23%
Pacific	+ 6%

Occupational Accidents

Deaths from occupational accidents numbered approximately 1,300 in October, an increase of 8 per cent over October, 1949. The ten-month total also increased—4 per cent—from 12,400 in 1949 to 12,900 in 1950.

The October frequency rate per million man-hours in seven sectional accident prevention contests conducted by the National Safety Council was 6.99, a decrease of 9 per cent from October, 1949. The ten-month rate was 6.76, a reduction of only 3 per cent. The October rate for community council interplant contests was 9.76, a decrease of 3 per cent from October, 1949. The ten-month rate also decreased—10 per cent to 9.10.

Public Deaths

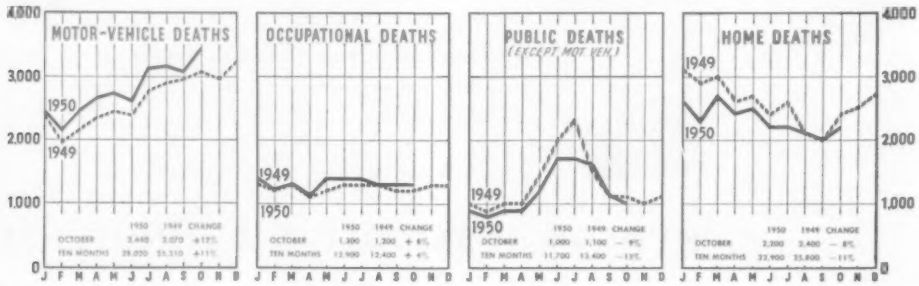
There were approximately 1,000 deaths from public non-motor-vehicle accidents in October, or 9 per cent fewer than in October, 1949.

The ten-month total was 11,700, or 13 per cent below the 1949 total of 13,400. Sizable reductions were recorded in deaths from transportation accidents, drownings, firearms and falls. Fatalities resulting from burns showed a large increase over 1949. Decreases were reported in all age groups with the greatest improvement recorded for persons 45 to 64 years old, and persons 65 years and over.

Home Deaths

October deaths from home accidents numbered approximately 2,200, a decrease of 200 from October, 1949.

The January-October total was 22,900, an 11 per cent reduction from the 1949 comparable total of 25,800. The decrease was confined largely to deaths from mechanical suffocation, falls and unclassified home accidents. Fatal poisonings, burns and firearms accidents showed little change from 1949. Most of the reduction occurred among persons 65 years and over.



This Little man Spells trouble...

He starts by asking, "Are You Mr. So-and-So?" Before you can blink your eye, he slaps you with a subpoena and suddenly you are the defendant in a negligence suit. Somebody fell on the slippery floor of your building and is suing you for a king's ransom.

The Legge System of Safety Floor Maintenance makes slippery floor hazards unnecessary. The secret and exclusive formulas of Legge safety floor cleaners and polishes give *shine-without-slipperiness* to the floors of buildings, plants and institutions. The Legge System imparts a durable gloss which nevertheless has *maximum slip-resistance.*

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Perhaps you have been fortunate thus far in escaping costly negligence suits. But how about the *condition* of your floors? How about their *appearance?*

In the past, the Legge System has performed seeming miracles in restoring floors that were ready to be scrapped. But there's a limit even to Legge ingenuity. It's wise to call us *before* inferior products and old-fashioned maintenance methods damage your floors beyond rehabilitation.

If you have a sensible regard for the value of your property, simply clip the coupon and mail today for a revealing booklet on scientific floor care. It's free and there's no obligation whatever. Better do it now, please. WALTER G. LEGGE COMPANY, INC., New York 17, N. Y. Branch offices in principal cities. In Toronto—J. W. TURNER CO.

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LEGGE SYSTEM
of Safety Floor Maintenance

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(Fiction)

THE READERS LEND A HAND

By BILL ANDREWS

Editor's Note: *In the January installment of the Diary, Harry Dexter, new assistant to the safety engineer, made a routine plant inspection at the Galeston plant of the mythical Jackson-Barnes Co. In attempting to secure improved housekeeping in one department, Dexter quite innocently aroused the anger of the department supervisor, Diehl. Dexter was seriously concerned that he might have damaged the safety program, and he wrote asking his boss what to do. The head safety engineer, the "I" of the Diary, concluded the installment by inviting readers to submit advice on what to say to Harry. What follows is the advice given in the fictional situation by very real readers of* NATIONAL SAFETY NEWS.

L. E. MITCHISON, *safety engineer with American Oil Company, Baltimore, Md., wrote:*

Read your article in NATIONAL SAFETY NEWS, "The Kid and the Crisis," and found myself walking along beside the kid with my hand on his shoulder telling him he was doing fine and that I was with him all the way, thinking to myself he is doing a damn sight better than I would. (I haven't had too much experience in this safety racket—only a little over twenty years.)

Then I came to your poser at the end, "What do I do?" So I let the kid walk on ahead of me while I kicked that around in my mind, or perhaps I should say "while my single cerebral cell rattled around inside the problem." Finally came up with this: The kid did do a good job. He couldn't be held responsible for Diehl's "defensive attitude." (I probably would have termed it "sulky," offensive attitude which would have been damn poor psychology.)

I have a hunch that the hell that Diehl caught from the super was like the castor oil he got as a kid — nasty as hell but good for him, and since we know that employees prefer a clean, well ordered shop to a dirty, disordered one, Diehl is going to hear some nice remarks made by his workers on improved conditions that will tickle his ego and he, no doubt, will feel that the credit is all his. In fact, I'll bet he walks into some other guy's department that maybe isn't quite as well cleaned up, looks down his nose with the mental remark, "This place looks like hell, he oughta come over and see mine."

Guess I will try to catch up with the Kid again and tag along a little farther.

J. E. MILLER, *plant manager, B. F. Goodrich Chemical Company, Port Neches, Texas, submitted a draft letter for the safety engineer to write to his worried assistant:*

DEAR HARRY;

As I have often told you, the human relations angle of our job as safety engineers is very important, but we must never let it interfere with getting the job done.

Your experience with Diehl and your impromptu session in the plant manager's office were unfortunate from your standpoint, but time will tell whether or not the same applies to the job to be done — namely, Diehl's getting and keeping his department clean. If that is accomplished, then Diehl will sell himself on the necessity for good housekeeping.

If Diehl does not react favorably to the plant manager's instructions, than we can only assume that he will follow up with the necessary action to see that the job is done.

Getting back to your position in this case, or other similar cases that will embarrass you in the fu-

—*To page 66*

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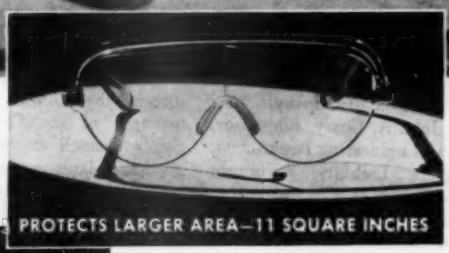
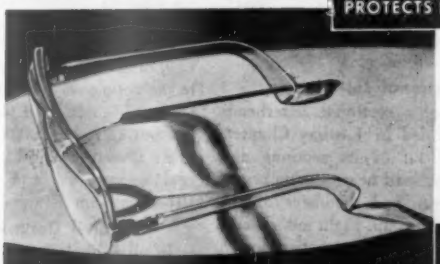
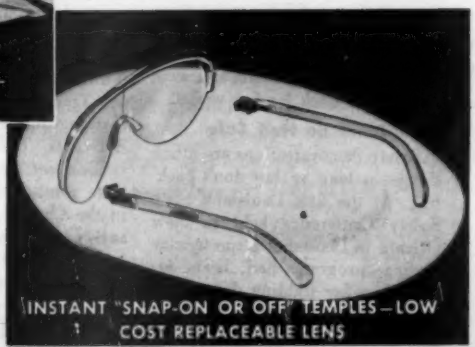


PROTECTS LARGER AREA—11 SQUARE INCHES



FITS CONTOUR OF FACE AND HEAD—SPHERICAL CURVE FOR EACH EYE



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WRITE FOR LITERATURE AND PRICES

UNITED STATES SAFETY SERVICE CO.

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Green Cross News . . .

Activities of Local Safety Councils and Chapters

Compiled by TOM A. BURKE
Director of Local Safety Programs, Field Organization, NSC

"Five Key Course"

There was a total registration of 2,053 industrial safety people at the "Five Key Course to Successful Supervision" sponsored recently by the Greater New York Safety Council. The "keys" were "Accidents Concern You"; "Watch for Straws in the Wind"; "Get the Facts"; "Do a Training Job"; and "Bring Out the Best in Yourself." Speakers were Ralph J. Crosby, assistant vice-president, Marsh-McLennan of New York, Dr. N. E. Eckelberry, senior assitant medical director, Consolidated Edison Company, New York; John A. Geary, supervisor, Training Engineering Department, Employers Liability Assurance Corp.; Clifton H. Cox, president, Clifton H. Cox Company, industrial consultants; and Augustus E. Califano, personnel and human relations counselor. Harry P. Heubner was chairman of the course. Certificates were issued to all who attended four of the five sessions, held in the Statler Hotel Grand Ballroom. The course was free to member companies of the Safety Council but a $5.00 registration was charged each representative of a non-member company. The sessions started October 31, and were held once a week for five weeks.

Don't Be Half Safe

Safety demonstrations are a fine thing—as long as they don't backfire. At the first Louisiana State Safety Conference held in New Orleans in December a spectacular closing program had been arranged, a fire fighting demonstration staged at the Police Training School in an open field on the outskirts of the city. Special pits had been dug to prevent spreading flames and the large crowd was kept at a safe distance. Everything was going fine until a sudden wind shift caused the flames to flare back on three city firemen who were demonstrating how simple it was to quench the flames. One fireman was rushed to the hospital with burns on hands and face and the other two received first aid at the scene of the mishap. None of the three were seriously injured but when professional safety people sponsor public demonstrations, the slightest injury will invariably make the front pages.

The first State Conference was directed by Charles F. Doerler, manager of the Caddo Bossier Safety Council at Shreveport. A good attendance enjoyed good programs in the industrial, traffic and marine safety fields. Arthur J. Naquin of New Orleans Public Service was the general chairman of the conference.

Sectional Letterheads

Two-color sectional letterheads are provided by Eastbay Chapter, NSC, to all of its sections and each letterhead bears the names of the officers and members of the particular group. Eight letterheads, each with its own attractive design and color scheme, are already in use by the Industrial, School, Motor Transportation, Public Information, Child and Home, Women's Activities, Traffic and Fire Prevention sections. The letterheads were printed by multilith process in the Chapter office. Needless to say the idea has made a big hit with all sectional offices and committee members.

Fire Prevention School

The first session of the 1950 Plant Protection and Fire Prevention School of the Safety Division of the Milwaukee Association of Commerce was held on Wednesday evening, November 29, and was devoted to the timely subject, "Industry Prepares for Civil Defense." The training of fire brigades was the subject for the December 6 meeting and a week later the closing session was devoted to combustible and electrical hazards, with demonstrations. Carl A. Patton of International Harvester Company was chairman of the course which had an enrollment of 4,200. This was the school's 27th annual session.

New Publication

The first issue of the "Chemung County Safety Council News" was distributed recently throughout the Elmira (N.Y.) area. It is a newsy four-page tabloid size newspaper, intelligently edited and featuring pertinent information that should be most helpful in selling the Chemung County Safety Council to the people of the district. W. J. Olcheski is editor of the new publication. Cartoons, mats, charts and other illustrations add to the general appearance and the Green Cross emblem is displayed.

Civil Defense

In all probability local chapters and Safety Councils will be called upon to aid in local civil defense and once again the managers will be asked to take part in war-time conservation of man-power programs. In the St. Joseph-Benton Harbor area the Twin Cities Safety Council has taken over the direction of the local civil defense program. If World War III really comes the civil defense problem will be much more important than ever before. This time the bombs will fall here. Your part in the civil defense program will have to be determined by your executive

This Firefighter can be two places at once!

You can protect several danger spots at one time with a Kidde built-in carbon dioxide fire extinguishing system. ¶ Widely separated fire hazards... even on different floors can be protected by a single Kidde system. If fire strikes a protected space, directional valves rush fire-smothering carbon dioxide gas to the stricken area. The same CO_2 can set off mechanisms to shut doors and windows... turn off fans and machinery. After doing its job, the clean, dry CO_2 evaporates completely. ¶ Whatever your fire detection and protection problem may be, a Kidde expert will be glad to help. When you think of CO_2 call Kidde.

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Actuated by sensitive rate-of-rise thermostats, Blaw-Knox Sprinklers go into immediate action . . . sending a heavy, quenching blanket of water to the danger spot, extinguishing the fire and protecting adjacent areas. Blaw-Knox Fog Nozzles have no screens to clog, do not require treated water and maintain their effective spray pattern even at reduced pressures.

At your request a Blaw-Knox engineer will make a survey of your fire hazards, prepare a preliminary layout that will give you the utmost in fire protection and submit an estimate of costs—all without obligation.

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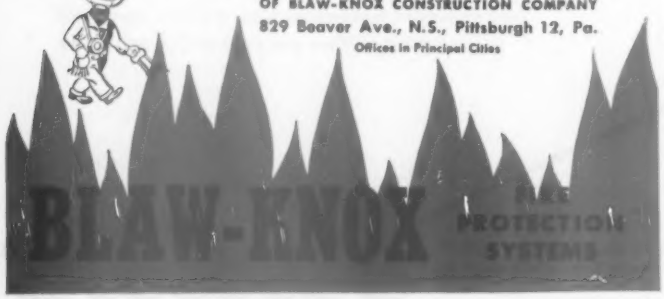


committee and governing board. Better be thinking about it. The safety of America and the world is really the biggest safety problem we face today.

Louisville Award Plan

The Louisville Safety Council has inaugurated a plan for giving due recognition to citizens for outstanding work in community safety. A framed certificate is presented for distinguished service. The first of these awards was presented recently to G. A. Heuser, leading industrialist, member of the Louisville board of directors and formerly a member of the National Safety Council board. Mr. Heuser, a former president of the Louisville Council, has for several years headed the Council's finance committee. Another special award has been designed for presentation to each industrial member of the Louisville Council that reaches the million man-hour mark without a disabling injury. The first of these awards was given to the Bluegrass Cooperage Company, a subsidiary of the Brown-Forman Distillery.

Burrill Heads K. C. Council

Douglas G. Burrill, manager of Insurance Claims and Safety and the Real Estate Department of Socony Vacuum Oil Company, Kansas City, Mo., is the new president of the Kansas City Safety Council, elected at the November meeting of the board of governors. Burrill succeeds B. G. Borserine who held the post for two terms. Mrs. Lois Walker is the new chairman of the Women's Activities Division, succeeding Mrs. Thomas P. Mason.

Paper Pool-Buying

Local Chapters and Council managers in the Western Region are considering a plan for pool-buying of paper for use on the large 24-sheet outdoor poster boards throughout the Western area Council cities. Details are being worked out with Roy S. Marshall, head of the Sunset Outdoor Advertising Company. The western managers are also considering the utilization of joint purchasing power in buying quantities of paper drinking cups bearing safety emblems, for use by their member companies.

COMING EVENTS

In the Field of Safety

Feb. 6-7, Philadelphia

Seventeenth Annual Philadelphia Regional Safety Conference and Exhibit. (Bellevue-Stratford Hotel). Walter W. Matthews, managing director, Philadelphia Safety Council, 17th and Sansom Sts., Philadelphia 3.

Feb. 20-22, Urbana, Ill.

Thirty-seventh Annual Illinois Conference on Highway Engineering. William S. Pollard, Jr., College of Engineering, University of Illinois, Urbana, Ill.

Mar. 4-6, Birmingham, Ala.

Twelfth Annual Southern Safety Conference and Exposition. (Tutwiler Hotel). Braxton B. Carr, executive secretary, Southern Safety Conference, 2120 First Ave. North, Birmingham 3, Ala.

Mar. 6-7, South Bend, Ind.

Twelfth Annual Northern Indiana-Southern Michigan Safety Conference. (Indiana Club and Oliver Hotel). Eli D. Miller, manager, Safety Council Division, Assn. of Commerce, South Bend 7, Ind.

Mar. 19-20, Boston

Thirtieth Annual Safety Conference and Exposition, Edgar F. Copell, president, Massachusetts Safety Council, 31 State St., Boston 9, Mass.

Mar. 26-27, San Antonio, Tex.

Texas Safety Association, Inc., Annual Conference. (Gunter Hotel). J. O. Musick, general manager, 815 Brown Bldg., Austin, Tex.

Apr. 3-6, New York

Twenty-first Annual Greater New York Safety Convention and Exposition. (Hotel Statler). Paul F. Stricker, executive vice-president, Greater New York Safety Council, 60 E. 42nd St., New York 17.

Apr. 10-12, Columbus, O.

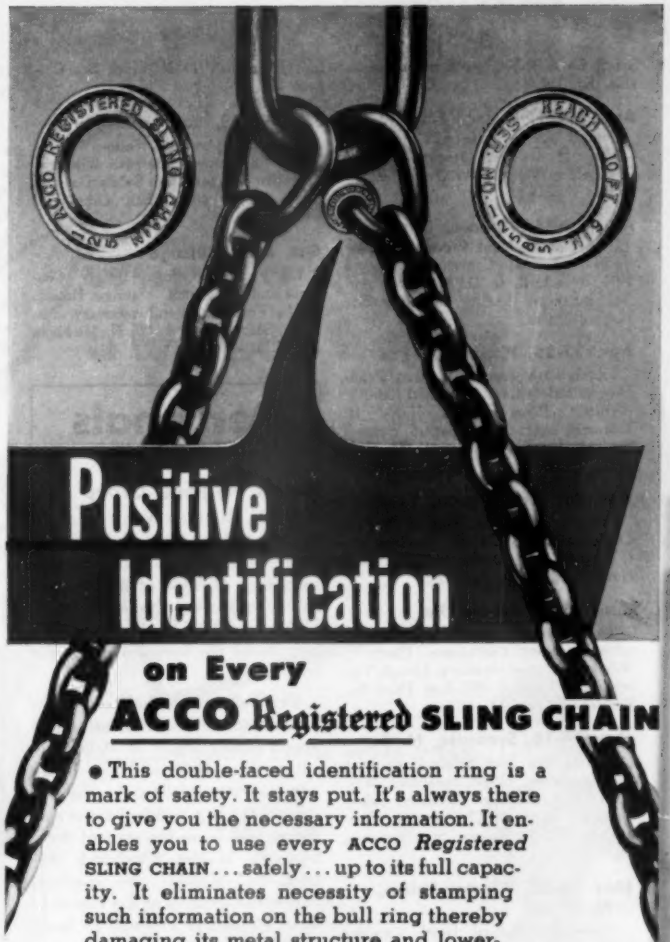
Twenty-first All Ohio Safety Congress and Exhibit. (Neil House). James H. Fluker, Superintendent, Division of Safety and Hygiene, Industrial Commission of Ohio, Columbus 15, Ohio.

Apr. 18-20, Tulsa, Okla.

Annual Statewide Safety Conference. (Mayo Hotel). Glenn V. Carmichael, manager, Oklahoma State Safety Council, Oklahoma City, Okla.

Apr. 19-20, Louisville, Ky.

Annual Kentucky State-wide Safety Conference. (Kentucky Hotel). Estel Hack, managing director, Louisville



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Safety Council, 214 Speed Bldg., Louisville, Ky.

Apr. 19-21, Kansas City, Mo.

Central States Safety Congress. George M. Burns, director, Kansas City Safety Council, 419 Dwight Bldg., Kansas City 6, Mo.

Apr. 23-24, Toronto, Ont.

Industrial Accident Prevention Associations, Annual Convention. (Royal York Hotel). R. G. D. Anderson, general manager, IAPA, 600 Bay St., Toronto 2, Ont.

Apr. 23-26, Pittsburgh, Pa.

Twenty-sixth Annual Western Pennsylvania Safety Conference and Exhibit. (William Penn Hotel). Harry H. Brainerd, executive manager, Western Pennsylvania Safety Council, 605 Park Bldg., Pittsburgh 22, Pa.

Apr. 26, New Haven, Conn.

Connecticut Safety Society, Annual Conference. Donald H. Ackley, c/o G and O Manufacturing Co., New Haven, Conn. P.O. Box 1860.

May 9, Bethlehem, Pa.

Twenty-fourth Annual Eastern Pennsylvania Safety Conference. Harry C. Woods, executive secretary, Lehigh Valley Safety Council, 602 East Third St., Bethlehem, Pa.

May 14-16, Syracuse, N. Y.

Central New York Safety Conference and Exposition. (Hotel Syracuse). Walter L. Fox, executive secretary, Safety Division, Syracuse Chamber of Commerce, 351 S. Warren St., Syracuse, N. Y.

May 16-18, Winston-Salem, N. C.

Twenty-first Annual North Carolina Statewide Industrial Safety Conference. (Robert E. Lee Hotel.) H. S. Baucom, safety director, North Carolina Industrial Commission, Raleigh, N. C.

May 17-18, Duluth, Minn.

Twenty-seventh Annual Conference, Lake Superior Mines Safety Council. (Hotel Duluth). John A. Johnson, chief, Accident Prevention and Health Division, Region V, U. S. Bureau of Mines, 18 Federal Bldg., Duluth 2, Minn.

May 24-26, Norfolk, Va.

Seventeenth Annual Virginia Statewide Safety Conference. William M. Meyers, executive secretary, Richmond Safety Council, Allison Bldg., Richmond 19, Va.

June 4-7, Chicago

Twenty-eighth Annual Midwest Safety Conference. (Congress Hotel). Joseph F. Stech, manager, Greater Chicago Safety Council, 10 N. Clark St., Chicago 2.

June 21-23, Salt Lake City

Thirteenth Annual Western States Safety Conference. Clarence Williams, executive director, Utah Safety Council, State Capitol Bldg., Salt Lake City, Utah.

Oct. 8-12, Chicago

Thirty-ninth National Safety Congress and Exposition. (Stevens Hotel). R. L. Forney, general secretary, National Safety Council, 425 N. Michigan Ave., Chicago 11.

Personals

Heads Hygiene Group

DR. C. RICHARD WALMER, medical director of the Industrial Hygiene Foundation, has been named managing director of that organization to succeed the late John F. McMahon. The Foundation operates under the auspices of Mellon Institute.

Dr. Walmer, who has been medical director of the Foundation and also a senior fellow of Mellon Institute since 1946, will now be an administrative fellow in the Institute. He is a widely known specialist and is on the staff of three hospitals in the Pittsburgh district. Dr. Walmer also conducts courses of lectures at the University of Pittsburgh's School of Medicine and in its Graduate School of Public Health. In addition, he is active in numerous professional societies, and is chairman of several society committees, such as the industrial hygiene section of the Allegheny County Medical Society, and two committees of the American Association of Industrial Physicians and Surgeons: the health achievement in industry award committee and the medical education and graduate fellowship committee.

He is interested in all phases of public and industrial health, and is the author of a number of papers on industrial medical administration, tuberculosis, conservation of manpower, as well as general industrial hygiene and industrial medicine.

Dr. Walmer was born in Wilkinsburg, Pa., in 1911, and is a graduate of Staunton Military Academy, Washington & Jefferson College, the University of Pittsburgh School of Medicine, where he received his doctor's degree in 1938, and the University of Pennsylvania Graduate School of Medicine. He served his internship at Pittsburgh Hospital and his residency at Mercy Hospital, Pittsburgh.

WALTER F. AMES retired as manager of compensation and safety, Bethlehem Steel Company, on December 31, 1950. He will be succeeded by FRANK R. BARNAKO, as announced by J. M. Larkin, vice president of the company, in charge of industrial and public relations.

F. R. Barnako *W. F. Ames*

Following the practice of law for a number of years, Mr. Ames entered the employ of McClintic-Marshall Corporation, at Pittsburgh, in 1918, as manager of its insurance department. When that company was purchased by Bethlehem in 1931, Mr. Ames was transferred to the general offices of Bethlehem Steel Company in charge of workmen's compensation, and in 1933 became manager of compensation and safety. Besides his active service for Bethlehem Steel Company since that time, Mr. Ames has also actively participated in a number of organizations and undertakings related to workmen's compensation, industrial safety and the reduction of accidents generally.

Mr. Ames was graduated from

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the University of Michigan Law School in 1901 with the degree of LLB.

Frank R. Barnako, who succeeds Mr. Ames as manager of compensation and safety, has served as assistant manager of that division for the past four years. Mr. Barnako is a native of Easton, and was graduated from Lafayette College in 1933. Following his graduation from the University of Michigan Law School in 1936, he was admitted to the bar in Northampton County, and practiced law in Easton from 1937 until 1942, when he joined Bethlehem Steel Company, as a member of the compensation and safety department.

EDWARD B. LANDRY, safety director for the U. S. Post Office Department, was elected chairman of the Washington-Baltimore Section of the American Industrial Hygiene Association for 1951 at the recent annual meeting of the section. Other officers are:

Vice-chairman — ROYD R. SAYERS, M.D., former director of the U. S. Bureau of Mines and now consultant for the Baltimore City Health Department and chairman of the Medical Advisory Board of the United Mine Workers Welfare and Retirement Fund.

Secretary-Treasurer — G. S. REICHENBACH, JR., industrial hygienist, Bethlehem Steel Company, Baltimore.

J. H. DIVINE has been named assistant safety director for The Manufacturers Light and Heat Company and associated Pittsburgh Group companies in the Columbia Gas System. He assumes the responsibilities of the late Charles A. Aaron who died recently after 34 years of gas company service.

Mr. Divine has been in the treasury department of the Pittsburgh Group companies since 1938.

ALLEN FOLTS has been appointed safety director and suggestion supervisor for the Eclipse Machine Division, Bendix Aviation Corp., Elmira, N. Y. He succeeds Stanley Bogacyk who resigned recently.

Mr. Folts went to Eclipse from the Brown-Lipe-Chapin Division of General Motors, Syracuse, N. Y., where he had been employed for the past ten years. During his first four years there he was in the manufacturing and inspection departments and subsequently was on the staff of the safety department.

SAFETY LIBRARY FOR SALE

Covers Industrial Safety and Health and Automotive and Public Safety. Contains approximately 1500 booklets and pamphlets, 1000 magazine clippings and 75 books. Includes publications from all important sources. Can be obtained less than the purchase price of the publications. You pay nothing for the thousands of hours spent in building and indexing the Library. For detailed information address Box 416, NATIONAL SAFETY NEWS.

Obituary

GEORGE H. LOWE

GEORGE H. LOWE, president of the Utah Safety Council and a member of the Board of Directors of the National Safety Council since 1944, died January 6 in a hospital in Ogden, Utah.

Mr. Lowe, who had been in law practice in Ogden since 1928, was prominent in safety and in many other civic activities. He was an active member of the Church of Jesus Christ of Latter Day Saints and was a high priest in Mt. Ogden L D S stake.

George H. Lowe

He was born September 28, 1883, in Willard, Utah, After graduation from the University of Utah he attended the University of Michigan where he received his law degree in 1911.

His civic interests included the Kiwanis International, in which he served as president of the local club, as governor of the Utah-Idaho district, and as a member of the International board of trustees, the Community Chest and the Boy Scouts.

Survivors include his widow, two sons and eight grandchildren.

THOMAS R. SELF

THOMAS R. SELF, Southern Division engineering manager for American Mutual Liability Insurance Company at Atlanta, Ga., and vice-chairman of the Textile Section, NSC, died December 29. He was 52 years old.

Mr. Self was born in Birmingham, Ala., August 24, 1898. From 1924-29 he was with Connors Steel Company. He then joined American Mutual as field safety engineer and since March 1947 had been division engineering manager.

Announce Conference on Industrial Relations

The Ninth Annual Minnesota Industrial Relations Conference, sponsored by the University of Minnesota Industrial Relations Center and the Twin Cities chapter of the Society for Advancement of Management, will be held April 12-13 at the University of Minnesota Center for Continuation Study.

Recognizing the great importance of efficient training procedures in an expanded defense effort, this year's conference will be concerned with the general problem of building effective training programs.

THE HONOR ROLL

Records of operation exceeding 500,000 man-hours, or one year, if exposure exceeds 250,000 man-hours, without a disabling (lost-time) injury are invited.

American Bridge Company
Ambridge, Pa.—November 7 to December 7, 1950; 565,189 man-hours.

American Smelting and Refining Co.
Selby, Calif., Smelting Works—October 16, 1949, to August 1, 1950; 535,817 man-hours.

Mason, Silas, Co.
Operating contractor at Iowa Ordnance Plant, Burlington, Ia.—November 25, 1949, to November 25, 1950; 1,841,815 man-hours.

Procter & Gamble Co.
Chicago—2,000,000 man-hours; *Port Ivory*—1,361,358 man-hours. (Both records as of December 6, 1950).

Republic Steel Corp.
Youngstown District, Transportation Department — 589 days; 1,601,460 man-hours as of November 17, 1950.

Youngstown District, Electrical Department — one year; 422,344 man-hours as of December 20, 1950; continuing.

St. Regis Paper Co.
Kalamazoo, Mich.—May 17 to November 30, 1950; 976,623 man-hours.

The Pure Oil Co.
Smiths Bluff Refinery, Nederland, Tex.—September 28 to December 28; 555,312 man-hours.

U. S. Department of the Interior
Bureau of Reclamation, Trenton, Neb., Dam—November 21, 1949, through December 31, 1950; 436,187 man-hours. Exposure covers both government and contractor personnel.

United States Steel Products Co.
Sharon, Pa., Plant—November 1, 1948, to March 31, 1950; 1,014,800 man-hours.

Wright Aeronautical Corp.
Wood Ridge, N. J.—September 12 through October 30, 1950; 1,851,678 man-hours.

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The Safety Library

Books, Pamphlets and Periodicals of Interest to Safety Men

Refinery Inspection

Recommended Practices for Refinery Inspections, Published by American Petroleum Institute, 50 West 50th Street, New York 20. Part I—Process Equipment, 1948; 104 p.; $3.00. Part II—Pressure Relieving Devices, 1950; 21 p.; .75. Part III—Fire-Protection Equipment, 1950; 47 p.; $1.00.

The American Petroleum Institute has recently released three of the contemplated series of booklets covering recommended practices for refinery inspections.

Part One — "Process Equipment" is intended as a guide covering the inspection of existing operating equipment. Equipment that requires inspection and the frequency of inspections are covered in the opening chapters. Organization and responsibility of inspection departments are covered both for large and small plants.

Methods of inspection of various types of equipment and how they apply to the component parts — vessels, tubing, pipe, valve and other fittings — are given in some detail. Minimum allowable thickness and retirement limits for various types of equipment such as nozzles, valves, pipe and other fittings are given in easy to follow chart form.

Inspection records for vessels and fittings are reproduced for those who contemplate setting up inspection programs. Tools used in conducting inspections are shown in complete engineering detail. Many of these tools are not available commercially but from the illustrations it would be possible to have them constructed by qualified fabricators.

Part Two — "Pressure Devices." This booklet covers the inspection of existing pressure relieving devices such as weight-loaded, spring-loaded and pilot-operated valves. Rupture disks are also included. Realizing that inspection practice in small plants will differ from that in large refineries programs are presented for all types of plants. Service records and report forms are presented as a part of the booklet.

Part Three — "Fire Protection Equipment." Recognizing that regular inspection of fire-fighting equipment is necessary to maintain an efficient emergency fire control system, this booklet covers both fixed and portable equipment. Fire pumps, pump houses, water lines, sprinkler and fire alarm systems are covered as part of the fixed fire control equipment. Portable equipment is covered under fire extinguishers and hose lines. The book includes a collection of typical information forms used in the regular checking of the refinery fire-fighting layout.

These booklets represent the recommendations of the petroleum industry on the subjects covered under each title. They are not intended as regulations for the purchase of new equipment but cover only equipment now in use. Although written in code form they are not intended to supersede existing regulations or laws but merely to supplement them.

R. G. Benson

BOOKS AND PAMPHLETS

Aeronautical Industries

Safety Standards for Low Pressure Chambers Under Variable Temperature Conditions. Published by Aircraft Industries Association. 610 Shoreham Bldg., Washington 5, D. C. 1950. 23 p. No price listed (ATC Report—No. ARIC-1)

Alcohol

The Problem Drinker in Industry. Published by Allis-Chalmers Manufacturing Company, Industrial Relations Division. 864 S. 70th St., Milwaukee Wis. 1950. 18 p. Free.

Construction

Work Injuries in Construction 1948-49. Published by U. S. Bureau of Labor Statistics. 1950. 35 p. For sale by the Superintendent of Documents, Washington 25, D. C. Price 25c (Bulletin No. 1004)

Food Industry

Work Accidents in Food Processing. Published by Workmen's Compensation Board, State of New York. 80 Center St., New York. 1950. 51 p. Free.

Health

Evaluation of Industrial Disability. By the Committee for Standardization of Joint Measurements in Industrial Injury Cases of The California Medical Association and Industrial Accident Commission. Published by Oxford University Press. New York. 1950. 89 p. Price $4.00.

National Defense

Chicago Alerts. Published by The Chicago Civil Defense Committee. 72 W. Adams St., Chicago 90. 1950. 266 p. Price $2.50.

United States Civil Defense—Health Services and Special Weapons Defense. Published by Federal Civil Defense Administration. 1950. 260 p. For sale by The Superintendent of Documents. Washington 25, D. C. Price 60c. (AG-11-1)

You and the Atomic Bomb. Published by New York State Civil Defense Commission. 1950. 32 p. Available from Department E, *Life* Magazine, 9 Rockefeller Plaza, New York 20, Price 10c.

Textile Industry

Survey on Causes and Prevention of Cotton Fires. Published by National Board of Fire Under-

Indexes

Indexes for the NATIONAL SAFETY NEWS (July through December 1950) and the INDUSTRIAL SUPERVISOR (January through December 1950) are now in stock at Council headquarters.

1950. 34 p. Fire (N.B.F.U. Research Report No. 8)

MAGAZINE ARTICLES

Carbon Monoxide

Death Lurks in Carbon Black Tank. (In Monitor (Ohio) December 1950—p. 163)

Economics of Safety

How Safety Program Pays Dividends. By W. R. Elliot (In Supervision, December 1950, p. 18)

Housekeeping

Foremen as Housekeepers. By Bert V. Tornborgh (In Supervision, December 1950, p. 12)

Lighting

The Relation of Light to Safety. By H. L. Logan. (In American Journal of Optometry and Archives of American Academy of Optometry. December 1950, p. 562)

Power Presses

New Adjustable Press Guard Destroyed by Martin's Ferry Plant. By T. C. Carrico. (In Monitor (Ohio) December 1950, p. 170)

National Defense

Civil Defense (In Public Health Reports. November 17, 1950, p. 1495)

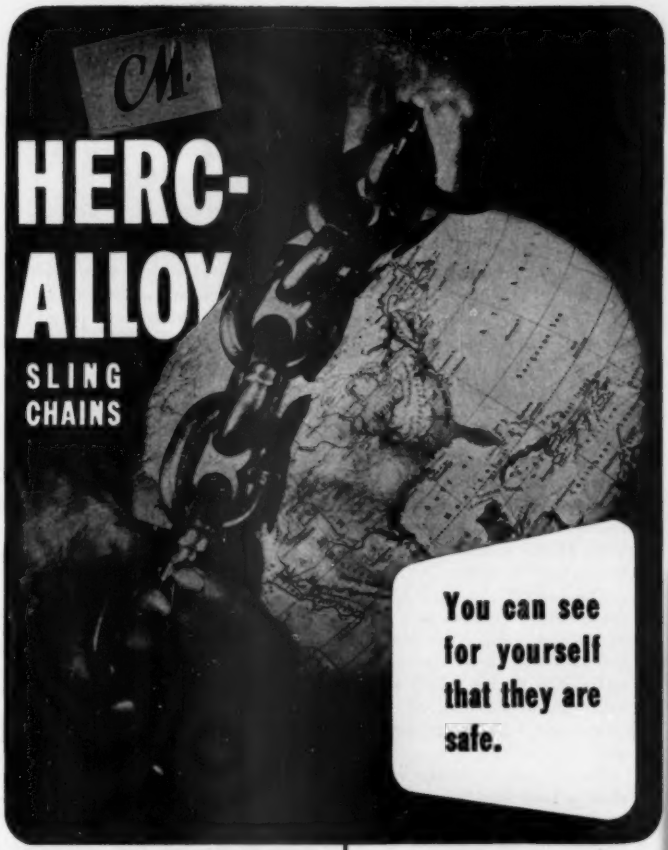
Welding

Safety Tips in Handling Oxy-acetylene Equipment. (In Roads and Streets, December 1950, p. 41)

Non-Toxic Substitutes

The article "Facts and Fancies About Ladders," which appeared in the December 1950 issue of NATIONAL SAFETY NEWS, mentioned the use of carbon tetrachloride for the detection of small compression failures in wood ladders. Attention is called by the Forest Products Laboratory to the fact that carbon tetrachloride fumes are toxic, although in this case exposure is brief and relatively infrequent.

Other fluids may be used for the same purpose without the problem of toxicity. Two that are considered suitable are secondary butyl alcohol (flash point 82 F.) and methyl ethyl ketone (flash point 30 F.). Customary precautions in handling flammable liquids should be exercised.



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Function Plus Beauty

(From page 19)

in recent years and a consistent safety program, stressing housekeeping and fire protection, is carried on.

Tunnels connecting the various areas of the plants prevent much surface traffic congestion and exposure of persons and materials to weather.

The Tower

The construction details of the tower are no less interesting than its appearance. All floors are cantilevered from the central core and none of the weight is supported by the outside walls.

The central core, the heart of the structure, consists of a cluster of circular shafts. The center or main shaft is 13 feet in diameter and houses the air supply and exhaust chambers, plus all of the utility and building piping services.

On one side, a circular elevator shaft is built into the main shaft; on the opposite side, a semi-circular stairway. The reinforced concrete walls of this fibrous stem vary from 7 to 10 inches in thickness. They support the weight of the entire structure.

The core is anchored to a concrete foundation which penetrates 54 feet into the earth and provides support for the structure in much the same way as do the roots of a tree. This underground foundation contains 500 cubic yards of concrete as compared with 1100 in the superstructure.

Concrete of extra strength was used. Ordinarily a strength requirement of 3000 pounds per square inch is considered ample. For the tower, the specification was 5,000 pounds. Expert carpentry was required to make the thin plywood forms backed up with 2 by 4 wales and steel channel bands around the central core. Because of the intricate curves, quarter-inch material was used.

Floors are in pairs, 40 feet square floors alternating with circular floors of slightly smaller diameter which are much like balconies. This arrangement permits the installation of tall laboratory equipment and facilities communication.

Each floor consists of an upper and lower slab of reinforced concrete, the lower slab tapering downward to the central core and forming the ceiling of the floor below. The hollow space between them forms a plenum for the distribution of fresh air from the air conditioning system. From this chamber, air is distributed to the floor below by means of 24 pierced openings in the lower slab.

The glass walls are constructed of 21 miles of two-inch glass tubing laid horizontally like logs with strips of synthetic rubber in between to serve as caulking. Aluminum uprights with semi-circular notches provide internal support for the tubes which are held in place by stainless steel wire. An inner wall of plate glass is separated from the outer wall by a three-inch air space.

Narrow strips of brickwork, marking the square floors, provide the only breaks in the glass surface. The circular floors, like large balconies, can be seen dimly through the glass tubing.

Cantilevers Carry Weight

None of the weight of the building is supported by these walls. All is borne by cantilevers extending from the central core. Many expected the floors and walls to sag when the supports were removed but deflection has been scarcely measurable.

This spectacular shaft houses the various activities in their natural relationship flowing downward — wax research, development and control laboratories — and thence outward into technical service, the pilot plant, and finally into the manufacturing areas. One floor is devoted to a reference library.

In the tower design, corridors are eliminated, making all space usable for work and service facilities. Reduction in the length of the service feed lines is also accomplished to an important degree due to the fact that they rise through the central core and spread out to the point where they are needed.

Underground and adjoining the tower is a complete pilot plant. Here are developed the manufacturing processes for new and improved products before they go into full scale production.

Safety Considerations

From the standpoint of safety for the technicians who work there, the tower layout offers some definite advantages. The fact that the laboratory is a separate strucure in itself tends to isolate some hazardous operations and the tower construction further reduces exposure to hazard as compared with a one or two story structure. Even the most intensive explosion would not endanger more than three or four men. Since the walls are of glass, much of the force of an explosion would be vented.

If for any reason fresh air is needed in an emergency, the glass walls can be broken easily with a chair or any tool that happened to be handy.

With all the work areas around the central core, few men would be in the direct line of an explosion, yet assistance to anyone injured would be readily available from workers on the other side of the floor. The central core also provides readily accessible exits from any floor. In an emergency no man would have to travel a long distance, perhaps through a danger area, to reach an exit.

Ventilation and fire protection have received thorough attention. The air conditioning system has been constructed to avoid recirculation of air. Fume hoods have auxiliary motors that boost the regular exhaust fans when the

hoods are in use. The two paint spray booths vent directly to the outside, allowing no fumes to remain in the building.

Automatic sprinklers have been installed on all floors and this protection has been supplemented with portable carbon dioxide extinguishers within easy reach of any location.

A safety shower, readily accessible and easily operated, is located on each floor.

In selecting fixtures for the tower, every effort was made to avoid combustible materials. Desks, chairs, work benches, etc., are of glass, metal and stone. Rubber tile, which combined fire resistance with other essential properties, was selected. Every item, incidentally, had to conform to Wright's very definite ideas of design.

The three years of actual construction work on the tower were preceded by several years of planning in which every detail of operating was studied. Working with the architect and his resident engineer John Halama, was a committee of the company's chemists and technicians headed by Dr. J. Vernon Steinle, research and development vice-president, and Dr. Robert N. Du Puis, research and development manager. They knew what they wanted and their ideas were incorporated in the plans.

A.M.A. Establishes Committee on Pesticides

A committee on pesticides to study the health problems associated with the use of insecticides, rodenticides, fungicides, herbicides, and similar commercial poisons, was recently established at the headquarters of the American Medical Association.

As part of its study on the safety and effectiveness of these chemicals, the committee is undertaking an intensive educational program to assist physicians and other health practitioners in recognizing and overcoming the difficulties which some of the newer compounds present.

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Here's how 3% Aer-O-Foam gives better performance	Foam Expansion at 70°F. (Gallons of foam per gallon of solution)	Minimum Operating Temperature, °F.*	FIRE TEST in accordance with nationally recognized standards: Coverage (Minutes)	Control (Minutes)	Extinguishment (Minutes)	Vapor Sealing Ability (Minutes)	Burn-Back Area** (Inches square)
3% Aer-O-Foam Liquid	10.25	0	0.80	1.66	2.25	20.0	10
Brand "Y"	9.00	6	1.33	4.00	4.33	6.5	19
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*Temperature below which foam liquid viscosity increases so that pick-up rate is too low.

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NATIONAL FOAM SYSTEM — CONTINUOUS PRODUCTION

Industrial Health

Abstracts of current literature on Industrial Hygiene, Medicine, and Nursing

By F. A. VAN ATTA, Industrial Deartment, NSC

Manual Resuscitation Methods

Manual Artificial Respiration, Comparison of Effectiveness of Various Methods on Apneic Normal Adults, by Archer S. Gordon, Frank Raymon, Max Sadove and A. C. Ivy. The Journal of the American Medical Association, 144:1447-1452 (December 23, 1950).

In this study the various commonly used manual methods of artificial respiration were compared on 11 adult male subjects first when they had voluntarily suspended respiration and then when they had been treated with curare and cyclopropane-oxygen anethesia until respiration ceased.

The methods used were the Schafer prone pressure method, the Emerson method (which consists in raising and lowering the hips with subject in a prone position), a modification of the Emerson method in which the far hip is turned so that the near hip rolls up on the operator's hand or knee, the Silvester method of alternately raising and lowering the arms with the subject in the supine position, the Nielsen method of lifting the arms above the head for inspiration and pressing on the scappulae for expiration with the subject in the prone position, the Drinker modification of the Nielsen method which combines the Schafer prone-pressure method with the Nielsen arm-lift maneuver, the Schafer-Emerson-Ivy method combining the Schafer prone-pressure with the Emerson hip lift and the modification of this combining the Schafer prone-pressure with the hip roll.

The results were not identical as between the subjects with voluntarily suspended respiration and the subjects anesthetized until respiration ceased but they were all in the same order and in the same order as the results of a previous study on warm corpses. The pulmonary ventilation on the conscious individuals who had voluntarily suspended respiration was about one and one-half times the ventilation on the anesthetized subjects and ventilation of the anesthetized subject again was considerably greater than the ventilation of warm corpses for the same type of artificial respiration.

It was noticeable that the amount of ventilation obtainable in tall thin individuals was much greater than that obtainable in short stocky individuals and that this difference became proportionately larger with the more effective methods.

The methods fall into two very distinct classes according to whether the inspirations and expirations were both forced as in the Silvester, Nielsen, Nielsen-Drinker, Schafer-Emerson-Ivy methods or only expiration or inspiration were forced as in the Schafer or Emerson methods. Approximately twice as much ventilation was obtained when both inspiration and expiration were forced.

The Eve rocking method was also studied although it is not strictly a manual method. Its effectiveness fell approximately half way between the two groups of manual methods.

The greatest amount of ventilation was obtained by the Silvester method which, however, has the distinct disadvantage that in about one-half of the anesthetized subjects the tongue fell back and closed the airway.

It is notable that all of the manual methods and the Eve method gave air exchanges comparable to the normal air exchange of a resting person with the deeply anesthetized subjects but that only the push and pull methods gave normal or nearly normal air exchange with the warm non-rigid corpses. In the deeply anesthetized individual the hip-lift prone-pressure combination gave an air exchange almost double that of the normal resting adult. This method is extremely fatiguing even if a belt around the hips is used to assist in the lifting phase. It could be carried on in short periods if a number of operators are available to spare each other off.

The hip roll prone-pressure method in which the individual's hips are rolled up onto one hand or the knee of the operator is less fatiguing and almost as effective as the hip-lift prone-pressure method. The arm-lift prone-pressure method and the arm-lift scapular pressure method of Nielsen are also both very effective. They are both considerably less fatiguing than either the hip-lift or hip roll method but have the disadvantage of requiring two operators to carry them on effectively. The scapular pressure method is also apt to produce injury if carried on too enthusiastically.

The rocking method of Eve gives quite adequate ventilation but like any and all mechanical devices it must be considered as an adjunct to the manual method since one cannot assume that the necessary mechanism will be available when needed.

Fluorine Poisoning

Toxicological and Metabolic Effects of Fluorine-Containing Compounds by Joseph Larner, M.D. Industrial Medicine and Surgery. 19:534-539 (November, 1950).

The toxicity of compounds containing fluorine has always been of considerable interest to pharma-

—To page 84

SUREFOOTED

as a fly *(almost)*

Each of the four soles shown, will REDUCE ACCIDENTS caused by slipping, and give extra long wear. Nearly all safety and work shoe manufacturers supply footwear with these soles.

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A fine cord and neoprene sole that is resistant to oil, grease, gasoline, acids, caustics and heat. Cord construction gives Neo-Cords a high non-slip efficiency for the life of the sole.

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An outstanding cork and neoprene sole that gives long non-slip wear. NEO-CORKS resist gasoline, oil, grease, acids and caustics. They won't pick up metal chips, are waterproof and cushion the feet.

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The finest cork and rubber sole. They are lightweight, waterproof and very slip-resistant. GRO-CORK soles won't pick up metal chips, they protect the feet from heat or cold, and are soft to walk on.

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Will you assist in a research program to obtain data on the proper sole to wear on a particular job? If so, let us know of any condition that is wrecking shoe soles or where footing is hazardous. We will cooperate with you, at no cost to your company, in determining what type of sole will be the safest and wear the longest.

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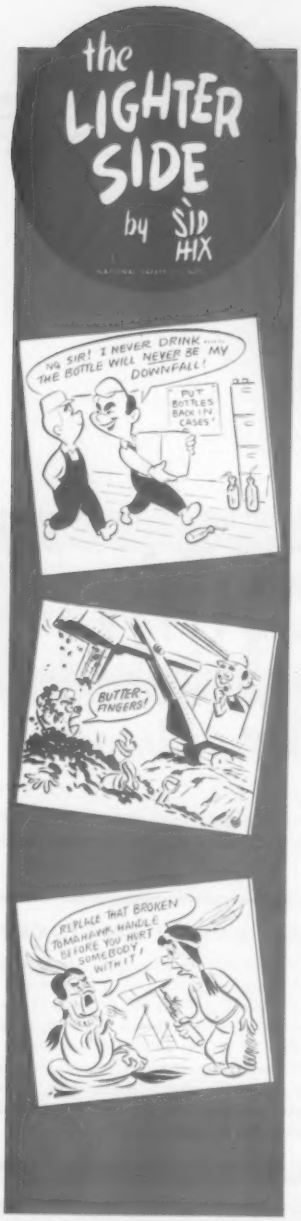
the LIGHTER SIDE
by SID HIX
"NO SIR! I NEVER DRINK... THE BOTTLE WILL NEVER BE MY DOWNFALL!"
"PUT BOTTLES BACK IN CASES"
BUTTER-FINGERS!
PLEASE THAT BROKEN TOMAHAWK HANDLE BEFORE YOU HURT SOMEBODY WITH IT

Definitions

Courtship—The short interlude between lipstick and mopstick.—*Brushware*

Are We Prepared!?

(From page 23)

there would be blast damage to the majority of homes and severe fire damage expected. In any large city with population concentrated at the time of the explosion, we would expect a casualty rate of tens of thousands.

That, briefly, is the effect of an atomic explosion of no greater magnitude than the "nominal bombs" exploded over Japan. What now has happened to your World War II type of civilian defense?

Shape of Disaster

First, your normal communications are gone. Telephone trunk lines and central offices are either wrecked, or have disappeared entirely. Major power lines have been destroyed. Police and fire department radio transmitters are silent. Streets are blocked. Water mains are severed. Fires are raging away from the center of the explosion. Severe radiation hazards may exist, depending on the height the bomb exploded. Highways leading from the city are blocked by fleeing residents.

Civilization Not Doomed

At this point we could easily — those of us who escaped the holocaust—stand off and while looking at the carnage take the point of view exemplified by Albert Einstein, who in 1945 wrote in the *Atlantic Monthly*: "I do not believe that civilization will be wiped out in a war fought with the atomic bomb. Perhaps two thirds of the people of the earth might be killed, but enough men capable of thinking, and enough books would be left to start again, and civilization could be restored."

Or, we can take the stand of William L. Laurence, noted *New York Times* science writer, who said by way of introduction to a series of articles entitled "We Are Not Helpless," that "There is nothing about atomic energy and atomic weapons that is beyond the grasp of the average laymen, and second, unreasoned fear that might lead to mass hysteria could produce more damage to life and property, and, more important, to spiritual values, than any number of atomic bombs."

Panic Worse Than Bomb

I believe with Laurence that panic following an atomic attack could result in greater and longer lasting damage to our ability to resist, or fight back against an aggressor, than caused by the bomb itself. Only by immediate control of highways, coordination of law enforcement agencies and trained civil defense forces, could panic be halted before it gets started.

Only through a highly integrated civil defense program could we avoid unnecessary loss of life; only through coordination of all medical and health facilities could we save some of the injured; only through proper planning of social agencies could we bring together shattered families and safeguard the youths who might otherwise turn to ways and practices of those young people of the devastated communities of Europe during the last war.

I would like to refer to the report of the National Security Resources Board entitled *United States Civil Defense*. The chapter on Application of Civil Defense Planning states, "The outcome of two world wars has been decided by the weight of American industrial production in support of a determined fighting force. In any future war, it is probable that an enemy would attempt at the outset to destroy or cripple the productive capacity of the United States and to carry direct attack against civilian communities to disrupt the support of the war effort."

One of the most essential parts of defense, civil or military, is communications. It is necessary for warning before an attack. It is even more necessary after an attack. To quote again from the National Security Resources Board report:

"The nerve system of civil defense is communications. Effective and rapid communications must be maintained between Federal and State and between State and local civil defense organizations and within these organizations if they are to function when needed. Even though our existing communications systems are efficient, in wartime they can be severely damaged in areas under heavy attack. Therefore every contingency must be provided for, and sound flexible plans developed so that in any emergency, communications in some form will be available."

Broadly, the program General Electric's Electronics Department is considering is this:

First: to interest the citizens of communities in the very real problem of civil defense without scaring the pants off of them.

Secondly: to make the knowledge and the know-how of our experts in electronics available to communities to study existing communications systems.

Third: to make available to communities a planning service to provide expert advice in the fields of air raid warning and communications.

I recognize fully that there are many persons in state and local governments and in positions of civic leadership, who feel that those who propose a strong civil defense organization are tilting at windmills. I know there are many who feel that the present risk does not justify the added expenditures. And in addition I know there are those who believe civil defense smacks too strongly of federal planning.

I feel strongly on these three points. Historically, we have either had sufficient warning of attack in the past to prepare ourselves, or the outbreak of hostilities occurred in an unexpected quarter while we were preparing against a threat to our national security, or we possessed allies of sufficient strength to fight a delaying action while we were making ready. No longer do oceans and distance protect us from any determined and ruthless enemy who possesses atomic weapons. Are we, then, tilting at windmills if we take precautions to eliminate surprise, confine the damage and alleviate the sufferings of the wounded?

We maintain police and fire departments, and do not rebel at the expense because there are no hold-ups nor fires. Can anyone who has lived through the years after the war and watched the march of Communism in Europe and Asia say that we are not in real danger?

As for socialism, if communities awakened to their responsibilities to their citizens, instead of awaiting federal instructions and federal funds, there would be no element of socialism in a civil defense program coordinated by the federal government. There is far greater danger of socialism in looking to Washington for grants, in centralizing all responsibility.

HANDLING HANDICAPS?

handle them better with HOOD gloves!

Many are the dangers to which employees' *vital* hands can be exposed in the course of a day while handling shipping crates, or when working with chemicals, oils, acids, etc.

Shown here are just two of the many types of Hood Industrial Gloves available to help rid you of any handicaps in these various handling operations ... gloves backed by the combined and continuing efforts of experienced chemists, engineers and technicians using the most modern equipment and techniques available.

Let the *proof* of "on the job" testing of Hood Industrial Gloves handle your protection problems from now on. Our catalog will show you the complete line of Neoprene, Rubber or Plastic coated gloves for *every* type of industry.

MODEL #4703
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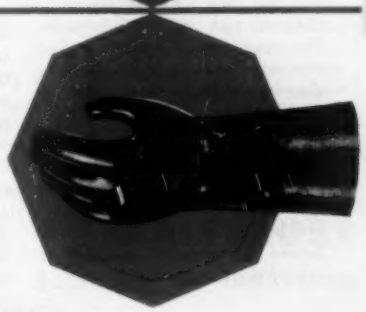

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— Full Neoprene coated industrial weight 14½" gauntlet. 6" cuff ... liquid proof ... curved fingers ... for all general industry.

HOOD for NEW Safety PLUS

HOOD RUBBER CO. Watertown, Mass.

Auditing Industry's MEDICAL SERVICES

By C. RICHARD WALMER, M.D.

THE audit of industry's medical administration may be undertaken, by a doctor at least, just as he undertakes to diagnose a patient. He wants a complete diagnosis through a complete examination. He must have all this before he can prescribe intelligently.

His principal tool is the question, and he must ask countless numbers of them, some seemingly insignificant, in order to arrive at the proper diagnosis. He will attempt to extract the following information.

1. Data on professional personnel, including physicians, local medical specialists, and nurses.
2. Description of the available medical facilities in a plant.
3. The number of cases treated by the facilities in a normal period of time.
4. Details on procedures used in physical examinations and dispensaries.
5. The laboratory facilities.
6. The manner in which records are kept.

The questions should be answered with complete frankness—just as in the case of individual patients. In this manner only can we arrive at the correct solution.

The information about the professional personnel is most important, for an entire industrial health program can stand or fall on the type of professionals charged with its administration. The examiner must know a great deal more about a plant physician than the college from which he was graduated or how long he has been practicing.

Working arrangements between plant and plant physician vary with the companies and the experts they employ. Therefore it is important to know how much time the doctor is expected to spend in the plant, and—more important—how much he actually spends. It must also be ascertained whether he is to follow up accident cases, or whether these are to be turned over to the injured employee's family physician.

The plant physician's skill should definitely come under consideration. It is important to know whether he does minor surgery, and also whether he is competent to perform major surgeries, or whether these cases are placed under the care of specialist consultants.

Without prying too closely into his personal affairs, a wise management should determine whether he be placed on a salary, retainer, a fee-for-case basis, or any combination of these three, how his remuneration is affected by state industrial commission fee schedules, and whether package plan insurance programs supplement his income.

The plant doctor can't do his job all alone. Besides the journeyman help he receives from male or female nurses, plus recent graduates serving their preceptorship in the plant hospital, he will also need the support of specialists and medical consultants. When a decision has been reached, their duties should be carefully outlined, so that both the consultant and the management will know exactly what the responsibilities and the limitations of the arrangements are.

Since these specialists and medical consultants are in part-time employ of the company, the records kept by them on company cases should be standardized in accordance with the desired company practice. The information thus gained is not only of value to the company's insurance department — it is needed by the safety department also, particularly if the consultant notices any predominant injuries or an unusual number of repeats of certain injuries.

Nursing Survey

A nursing personnel survey can be made similar to that of physicians, allowing for changes peculiar to professional and employment status. The extent of qualifications may be measured by age, type of training received, years of practice, industrial experience and employment record. Inquiry should further be made on assignment and rotation of shifts, seniority, starting and top salaries, and responsibility of the senior nurse for the duties of the junior nurses. The exact nature and limits of the nurse's duties should be determined. The duties and prerogatives of a nurse should be well outlined. She should know whether she has supervisory responsibility in regard to sanitation, either in wash rooms or the plant kitchen.

A doctor, no matter how good he is, cannot work without tools. Neither can a nurse. And if the tools are old or shopworn, they will not be much good. A conscientious and competent management will see to it that the tools of the department are as modern

—*To page 87*

THE AUTHOR: *Dr. C. Richard Walmer is Medical Director, Industrial Hygiene Foundation, Pittsburgh, Pa. The accompanying article is an abstract of an address before the Fifteenth Annual Meeting of the Foundation.*

NEW! ALL-WEATHER-SLIP-PROOF SUPER SAFE CETOX

Self-lustre, hydraoxated carnauba floor wax

- ***NO SILICAS OR OTHER ABRASIVES ARE USED***
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Dramatic, new floor wax development! The slip is taken out of carnauba (basic raw material) by chemical hydraoxation process. CETOX contains this hydraoxated carnauba. Now all floors can be *super-safe*—even under tracked in rain, snow or spilled water.

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Your fears of painful falls on shiny floors are at an end . . . if you dress up your floors with SUPER SAFE CETOX. Protect foot traffic . . . especially throughout year's 30% inclement weather. Tracked-in water is a dangerous lubricant underfoot. Use CETOX to be super safe, rain or shine.

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SUPER SAFE CETOX, applied in the regular way, dries quickly into a dazzling lustrous, long-wearing coating. It resists soil, abusive foot traffic and frequent moppings. Buffs up bright and shiny. Put SUPER SAFE CETOX on your floor once and you'll want it always.

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CHEMICAL SERVICE OF BALTIMORE

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New Pamphlet on Disaster Control

Through an arrangement with McGraw Hill Publishing Company, each industrial member of the National Safety Council will receive a copy of "Disaster Control," a reprint from *American Machinist*. This mailing will be made early in February as a part of the Council's technical release service.

This 40-page pamphlet covers clearly and concisely the problems involved in preparing an industrial plant to meet various types of disasters. While the atomic bomb is foremost in everybody's mind, other forces menace the plant in peace as well as in war. Prominent among these are fire and flood.

Psychological problems, as well as the prevention of physical damage to life and property, are treated comprehensively.

Certain phases of disaster control have always been included among the responsibilities of the safety director. As a result of the present emergency and the wishes of the Industrial Conference, the Council is using this means of keeping members informed.

Program Announced for Personnel Conference

Presentation and discussion of eight broad phases of modern personnel administration will make up the program of the 1951 "Conference on Industrial Personnel," to be held by the Department of Industrial Engineering, Columbia University, March 19 to 23, 1951, it has been announced by Professor William W. Waite, Conference Director.

The Conference, which will be attended by personnel executives and foremen representing some 50 industrial concerns, comprises five days of morning and afternoon sessions, and three evening meetings. Included are lectures and demonstrations, joint discussions.

With emphasis on "why it works," under the heading of "The Frontiers of Personnel Administration," the eight general topics to be presented are:

1. Communications
2. Design for Communications
3. The Theory of Joint Participation
4. The Practice of Joint Participation
5. Occupational Guidance in Industry
6. Budgeting of Employment
7. Personnel and Community
8. Flexibility and Tolerance in Personnel Systems

Diary of a Safety Engineer

(From page 46)

ture, I think there comes a time in any effective safety program when it might be necessary to steal a leaf from Diehl's book. Using his words in part—"get the hell out," human relations, it's time to use the rod.

If you are going to be a safety engineer, and you certainly have the ability, you must realize that you need never apologize to anybody for being one—and include yourself in that "anybody." Your profession is as honorable as any in the land. You have a service to perform to mankind that requires no apologies. So if in carrying out your duties, it becomes necessary to step on someone's toes — then do it.

In that case you would use your knowledge of human relations as a salve. And that is the job you have to do now with Diehl and the rest of the foremen in the plant. The job will not be too tough because the other foremen are keeping their departments clean so they are already sold on good housekeeping. Your job there is to sell yourself. I would wait to approach Diehl until you see whether or not he follows his plant manager's instructions. Knowing the manager as I do, this problem might solve itself.

If Diehl does go to work on the problem, then make it a point to congratulate him on his progress and let him know you will be watching for the day you can notify his boss that he is shooting par for the course.

Sincerely,
Safety Engineer
cc: Galeston Plant Manager

Safety Man's Responsibilities

J. W. STILL, *general superintendent, Miami Copper Company, Miami, Ariz., made the following comment:*

To start with, no safety engineer should ever be charged with the responsibility for the accident picture, for this responsibility properly belongs with the worker's direct boss and on up the management line — superintendent, manager, etc. A safety engineer who feels that his job carries this responsibility will carry too much weight, run with his neck out, and is almost certain to get into jams like the boy in your article.

My feeling is that the safety engineer should be a tactful sort of a hair shirt, which sounds somewhat impossible, but really isn't. His job is a selling job, pure missionary work — and such pressure as occasionally must be applied has got to come from the workman's or boss's immediate superior, not from the safety man. As on all selling jobs, the safety man should get to know his customers, the various bosses, foremen, supervisors, etc. Some he can sell direct; the better he knows them, and the more tactful his approach, the more he can sell in this way. However, when he does hit a stubborn or obstinate case, bulling it thru never works.

The above procedure has worked for us — with an agressive safety man who has had to be held back somewhat; and some 40 odd underground mine bosses — all pretty rugged individualists.

Assume Part of Blame

MARK FLAD, *safety supervisor, The Dayton Power and Light Company, Dayton, Ohio, wrote:*

Assuming part of the blame yourself for Harry's ineffectiveness when dealing directly with Diehl is the only honest and prop-

er approach. The situation existed before your assistant Harry ran head-on into Diehl's non-cooperative attitude and poor housekeeping. Had your previous relations with Diehl been on a better plan Harry's job would have been comparatively simple.

Agree with Harry that the two of you should see Diehl as soon as possible before the breach is widened. Lay all the cards on top of the table with Diehl on how the situation progressed and finally ended with the conference including his boss and the Personnel Department representative. Make it plain to Diehl that all three of you had a job to do, and the final conference was caused jointly by his neglect and your inability to sell your services as the safety man.

If Diehl is still wearing a chip after all this, go out of your way to be of service to him. No one can be angry very long when he knows in his heart he has been fairly dealt with.

When as the boss or leader you assume the responsibility for your assistant's inability to effectively sell the safety problem, your relations with the other departments will be at a new high, plus the respect and loyalty of Harry, your assistant, who needs a boost by active example rather than a good cry over spilt milk.

Clear with Branch Manager

Another Dayton Power and Light Company man, I. C. EPPLEY *of the electrical engineering department, said:*

Did you tell your young assistant that the first thing he should do when he arrived at the branch plant was to visit the plant manager and tell him what assignments you had given him? It is an exceptional man, having the responsibility of a branch, who can accept without resentment a procession of experts from the home office running through his plant and dealing directly with his people. Harry's position would have been much stronger if it could have been observed that his movements about the plant radiated directly from the boss' office.

It may also be presumed that, if the plant manager gave Harry

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● The symmetrical design of U·S·S Multigrip Floor Plate minimizes waste in cutting, making possible neat installations at minimum cost. And regardless of the way the plate is laid or the angle from which it is approached, Multigrip provides positive skid resistance in all directions . . . it's safe, wet or dry! Multigrip is easy to clean, too. There are no pockets to hold dirt, grease, water . . . drainage is complete and immediate.
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the "okay" to go ahead with the assignments, he would have invited Harry to come back in before he left the plant. I suspect that he would have wanted to hear about the unfavorable things that Harry found and would have liked an opportunity to clear them up and not let them be carried back to the home office. I do not think you would have objected so long as the conditions got cleared up.

I think that if you had instructed Harry to work through the plant manager, and it could have been obvious to the people in the plant that while Harry was there he was carrying out the local manager's orders, then Mr. Diehl would have acted quite differently toward him.

With respect to the ambitious new personnel man, Lane, if you did instruct Harry to work through the plant manager as I have suggested, then you should call Harry's attention to this mistake. He should have told Lane that his instructions from the plant manager were to come back there to discuss all of the matters which he was investigating. Harry should have told Lane that, undoubtedly, the manager would prefer to discuss all of the items at one time, I imagine the conditions in Diehl's department would then have materially improved before Harry even made his report.

On the other hand, if you sent Harry to the branch plant without even clearing through the manager there, then you had better accept all of the responsibility yourself for the ill-will that was created.

Help the Foreman

B.T. SMITH *of The Travelers in Hartford, Conn., referred to two questions the foreman, Diehl, asked the young safety man. They were: "How in hell am I expected to keep a shop neat with a bunch of sloppy workmen and a budget that won't let me hire anybody extra to swing a broom? Anyhow, why doesn't maintenance do a decent job?" Mr. Smith's comments are:*

Dexter could have promised to help Diehl get better maintenance if Diehl would agree to ask his men to be less sloppy in their work. Most foremen are interested in production, and it is not hard to prove that poor housekeeping causes a lot of waste motion. In general, Dexter didn't meet Diehl half-way and give Diehl the feeling that he wanted to help him, not just talk theory. It's always well to tell a foreman what you see in a situation like this, such as the men slipping on the oil spilled on the floor. That would have opened the door to a discussion to offset the statement about only two lost time cases in 18 months. Frequent no-lost-time accidents and no-injury accidents can cause considerable lost production time.

Finally, I would not go to the foreman's superior or the personnel man without telling the foreman I was going to do so and let him come with me. After all else failed, I would indicate to the foreman that I had a job to do and since he would not cooperate with me, I would have to go higher. Considering the age and lack of experience of Dexter, I think he should have written you a letter before he talked to the personnel man.

Inspection Reports

MAURICE SPILANE *of the Naval Supply Center, Norfolk, Va., made the following list of points:*

1. When inspecting, give a written report on a prepared form with space for the unusual things you find and for recommendations and suggestions. Also make a carbon for your file.

2. Address the report to the supervisor.

3. Tell him he can throw it in the wastebasket if he wishes, but that if any of the points result in an accident and top management comes to you, you can show your carbon copy of the inspection report.

4. On later inspections, you should find improvements, at which time you will note them on your inspection reports. Also on later inspections you will fine-comb it closer until your foremen are proud of their areas, employees, plus production with better morale among their workers. Then you become their friend.

After all, the answer is in his statement, "How in hell am I expected to keep a shop neat with a bunch of sloppy workmen." It is obvious that if they are sloppy in their housekeeping their work must be sloppy, which means costly spoilage and decreased production. So when he corrects one he improves the other, adding up to less spoilage and an increase in his big job responsibility, production. At about that time he should be getting a number of suggestions for work methods improvement, further improving his production. Harry, by this time, will feel like he has accomplished his first objective and can go on from there.

Keep Away from the Boss

M. W. BAKER, *Safety representative, U. S. Fidelity and Guaranty Co., Albuquerque, N. M., commented:*

If we would put our finger on any one point in the developments where tactics might have been changed, I propose that Harry Dexter should have overridden the personnel man, Lane, and prevented the matter from going to a higher management level at this time.

In all probability he would have had to put it on the basis of a personal favor with the promise that ultimately the safety department intended to rectify the situation.

I have repeatedly found that "backing-off" after pursuing a matter nearly to the breaking point, regrouping thoughts and forces and coming at the problem from a different angle, particularly while not in the heat of anger, has paid dividends.

It is entirely possible that had he waited to confer with you and others, a scheme more painless and also more effective would have evolved.

Wakeful Watchman

(From page 27)

This system is known as "electronic fire detection." It was first developed and approved as a local system, and has since been approved as an auxiliary system. It is the first closed-circuit system to be approved and the first to utilize one circuit to detect and record on a dial in the control cabinet the exact location of the fire.

Briefly, this sytem involves a control unit consisting of an assembly of relays, condensers, electronic tubes, and related electrical parts, all of which are energized by a nominal 115-volt, 60-cycle alternating current supply.

The control unit is designed for operation with automatic spot type thermostats, having normally closed contacts bridged by a capacitor and connected in a series circuit which starts from, and terminates at, the control unit.

Two styles of thermostats are used, both being identical except for the addition of a resistor in one style to obtain zone location.

The arrangement of the related electrical equipment and circuiting is designed to differentiate between an open circuit trouble condition and the open circuit function of the thermostat for an alarm signal.

Zone indication is obtained by relative changes in total resistance of artificial resistances in the thermostats; and the needle of the locator dial in the control unit indicates the corresponding zone.

A standby power unit forms an integral part of the unit, and is arranged to cut in automatically and take over the operation of the system in the event of power failure and, if necessary, maintain it for 72 hours. When normal power is restored, the standby power automatically ceases.

By replacing the detectors with closed circuit signal initiating devices which indicate water flow, gate valve position, water level, air or water pressure, the present system may be adapted to a sprinkler system which will meet the requirements of Underwriters Laboratories.

This particular system, with its

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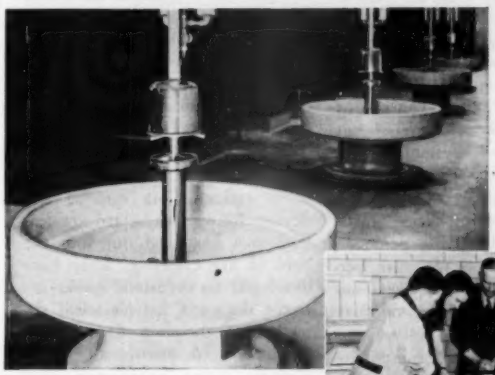

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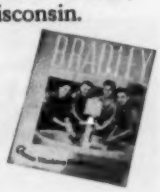

ability to locate a fire within an area the size of the ordinary hotel room, has almost unlimited possibilities of application. Since its approval in 1948 it has been installed in many properties, including several large bean drying plants in New York State. In two instances it detected and indicated the location of fires and, according to the owners, was definitely responsible for saving these properties from total destruction.

In addition to the above Lord-Taber system this company has recently designed a small local non-code automatic fire detection system for installation in private dwellings. The system consists of a small control unit and circuit non-supervised system, using closed circuit fire detectors.

The power supply required is a two-wire 115-volt, 60-cycle light or power source. Units are provided with a cord set for plugging into a standard receptacle. Power consumption under normal conditions is approximately four watts.

The detector circuit is a single conductor closed circuit loop with the detectors connected in series. Terminals are provided in the control unit for wiring connections to the detector loop and an alarm bell circuit. The alarm circuit terminals do not furnish current; they merely provide switching facilities through relay contacts, which may be used to complete an external alarm circuit. A buzzer alarm is located in the control unit. The alarm circuit terminals are provided so that an external alarm may be connected to those systems where desired.

Another system with a control unit operating on 110-volt alternating current is arranged to operate a gong and illuminate exit signs. It is somewhat restricted in its scope but has application in buildings where only a local alarm is desired. It has not been approved by Underwriters' Laboratories. It has been tested by Fire Chief Heinz of New Haven, who indicated recently that it no doubt would be reliable under certain limited conditions.

Ruxton Metal Products Company, Carlstadt, N. J., has designed a simple diaphragm type spot thermostat designed to operate at 130° F., but adjustable for higher or lower temperatures. The detector is designed to be adapted as part of, or addition to, an existing call or communication system such as those in use in industry, interhouse phone systems; or even to a door bell system in a home. The device is available at the present. An improved model is expected on the market in a few months. It has not been examined by Underwriters Laboratories. It appears to be well constructed and should give satisfactory service.

Walter Kidde and Company, manufacturer of manual and automatic extinguishing systems and devices for special hazard application, has branched out into the field of fire detection. They have developed an industrial smoke detector designed for electrical detection of incipient fires in fur vaults, record vaults, air ducts, storage rooms, warehouses, and other such areas which require fire detection by smoke detection.

Briefly, this detector system consists of three major components; the smoke analysis tube, the exhauster, which constantly draws samples of the atmosphere from the protected space, and the relay-control panel.

The smoke analysis element consists of a tube with a photo-electric cell at one end and a lamp of constant illumination at the other. The intake end of the tube is connected to a piping system terminating in air sampling openings of the protected space. The outlet on the cell end of the tube is connected to the suction side of the exhauster, so that air is drawn continuously from the sampling openings through the length of the analysis tube.

When smoke of sufficient density passes through the tube, decreasing the output of the photo-electric cell, a fire relay makes contact and signals the alarm through the relay-control panel either to a central supervisory station or to the plant fire headquarters. There seems to be no reason why this system cannot be connected directly to fire headquarters through a municipal fire alarm system, although the manufacturer makes no direct reference to such a connection.

The system is designed for single or multi-spaced detection. In a multi-space unit a special valving mechanism directs the atmospheric samples from four different spaces in rotation to the smoke analysis tube. Between each sampling, a fifth valve directs fresh air through the tube to purge it of residual traces of atmosphere from the previous space covered in rotation. This valve arrangement will give a specific signal as to the space which is in trouble.

A single line unit can protect approximately 4,000 to 4,500 square feet of area while the multi-line unit can cover approximately 16,000 square feet.

Both units are approved by Underwriters Laboratories. Several of them are in service in laboratories, generators, transformer vaults, and areas having hazards of a similar nature.

Infra-Red Sensitive

Fireye Corporation, an affiliate of Photoswitch Inc., Cambridge, Mass., has developed a detector, together with the necessary control panel, known as "Fireye." This corporation is a newcomer in the field of fire detection.

The principle of this detector is based on the lead sulfide layer type photoelectric cell which is sensitive in the infra-red region as well as in the visible light region.

The system is devised to detect fire and to discriminate against ambient light conditions by taking advantage of the light modulation characteristic of a flame. According to data furnished by the manufacturer, the detector has the ability to "see" and to react instantly to a fire anywhere within a volume designated as a firezone. It

will provide complete coverage throughout a room or firezone, and does not have to be located where it will be directly exposed to fire, or used in large numbers in order to "outguess" the location of the fire.

The detector is designed to ignore extraneous light of any intensity, such as the sun or artificial illumination, and still be capable of detecting a very small fire. It is capable of repeat detection without requiring replacement after a fire.

A single detector can effectively supervise a 20-foot radius coverage. This permits the detection of a fire as small as a pan of burning gasoline six inches in diameter, and at the same time provides a margin of safety for ignoring flames smaller than this, such as lighted matches within the range of the pickup device.

The entire system operates from 115-volt alternating current power; however a 6-volt dry battery is used for trouble indications for power failures. The detector is designed to mount directly on a three-inch outlet box.

Protection is available in units of a "block;" each block consists of a control panel and six detectors, each detector capable of monitoring a room 40′ x 40′ or the block can monitor a single open area 120′ x 80′. Protection for areas greater than this may be provided by combining several "blocks" to accomplish complete coverage.

The system is adaptable for use with fire alarm bells, lamp indicators, and all automatic extinguishing systems. It has been designed for easy installation in industrial, shipboard, and home applications.

The entire system has been tested by the U. S. Air Force and by government regulatory agencies for civil aviation. Indications are that it will be used widely in aircraft of all types in the near future. Tests are being conducted now for approval by Underwriters Laboratories. This device seems to lack one important feature. It is designed to report a fire only when flame is present. There seems to be no provision for recording a fire which might smolder for hours and gain considerable headway be-

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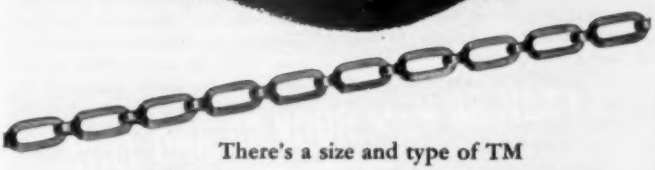

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fore flames actually break out into the open.

American District Telegraph Company's latest approved fire detection system is known as the Teletherm system which is, briefly, an automatic rate-of-rise temperature-rise fire detector operating on the thermoelectric principle.

Operation of the system depends upon the electric potential which is generated in exposed thermocouple junctions of one or more detectors, subjected to a rapid or abnormal rise in temperature. This generated potential produces a current change in an electrically supervised circuit to cause a central station transmitter to transmit a coded alarm.

Teletherm is intended for use as an automatic fire detecting system wherever an approved sensitive heat detecting rate-of-rise system for general premises protection is required.

Convection and Radiation

Two types of detectors are used in this system. One is a convection type for the protection of small enclosed areas which depends mainly for its operation upon direct contact by convection with the heated products of a fire, and also upon whatever stray radiation it may receive.

The second is a radiation receiving type of detector which is readily adaptable to the protection of large spaces or open areas, and which operates primarily on its ability to "see" the radiant energy emanating from the plume of hot gases and particles which result from fire.

This detector is equipped with a reflector, whose shape concentrates the received radiant heat energy upon a ring of "exposed" thermocouple junctions of a thermopile. Its effectiveness is demonstrated by the fact that it does not have to visually see the actual flames of a fire for detection, but depends upon its ability to view only the combustion products which mushroom to the ceiling.

A four junction convection type detector (having four exposed thermocouple junctions) will protect an area of 1,000 square feet, while the radiation type detector having 72 exposed junctions will protect an area having a radius of 105 feet with the detector located at a point on the ceiling from which the radius is drawn, or approximately 36,400 square feet.

One system may include both types of detectors and also fixed temperature type of thermostats, depending on the areas to be protected.

For several years, prior to and during World War II, Protectowire Company of Hanover, Mass., has been manufacturing a simple and effective automatic electric operated fire detection alarm system. Since its introduction to industry it has been improved to the point where it is now approved by Underwriters Laboratories as both a local and auxiliary detection and alarm system.

The basic principle of this system consists of an approved heat sensitive cable which is run on the ceiling or on sidewalls near the ceiling of the protected areas. The cable consists of two spring steel conductors with a thermoplastic or heat-sensitive insulation, twisted together.

The spring in the conductor exerts a continuous pressure on the insulation and at the critical or operating temperature the insulation yields to this pressure. This permits the conductors to move into contact with each other and operate the alarm.

This action takes place at the first heated point, anywhere along the cable. It does not require that any specified length of cable be heated, nor that the temperature must rise at any predetermined rate.

The ends of the cable are connected to an approved central unit which provides the necessary power supply (any available power supply 115/230 volt a.c. or with floating storage battery which is trickle charged from 115-volt a.c. including dry cells or other battery), to which one or more alarm bells are connected.

Subject to local conditions, a connection can be made to a fire station or other remote point over telephone lines or to a city fire alarm system.

One control panel will handle up to 6,000 feet (from one to six circuits) of Protectowire with circuits divided as required depending on local conditions. For large installations multiple control panels in units of six circuits may be employed to satisfy the situation. Under most conditions, subject to electrical ratings, two or more panels can be operated from one power supply unit.

The company still manufactures and installs simple and effective fire detection systems for special industrial and residential application, which are not approved. These particular systems are supervised only by the owners, and therefore are not recognized by rating authorities.

Private Dwellings

Of primary interest to all of us is what to do about reducing the appalling life loss in private dwelling fires. This subject has been under discussion by various groups for several years in an endeavor to arrive at a practical and economical method of warning occupants when a fire occurs.

It was the consensus that some form of automatic fire detection and alarm system would be the answer. In this connection, several manufacturers of fire detection devices have realized the need for an effective reasonably priced fire detections system for private dwellings and are already producing equipment for this purpose.

The matter was presented to the N.F.P.A. Committee on Signalling Systems for study and possible formulating of suitable standards. Standards, as we know them, were out of the question because, at best, any private dwelling fire alarm system would not be regularly supervised and in the majority of installations only fairly well maintained.

Therefore, the committee felt the best interests of all would be served if a "guide" of good practice suggestions was prepared to

bring out the essential features that must be considered when considering a system of this type. This "guide" was approved on May 18, 1950, at the annual meeting of the N.F.P.A. in Atlantic City.

The guide explains that the equipment be adequately reliable in operation and that the alarms be so located and sufficiently loud to awaken all sleeping occupants. Also, that the fire detectors be of an approved make, known to be suitable for the intended application, and that they should be permanently located on or at the ceiling and adjacent to any potential fire hazard, such as heaters or combustible material which under abnormal conditions may result in a fire.

Permanent Installation

Alarm bells or other sounding devices for indicating operation of a detection device should be permanently installed and located where they will be audible to all occupants of sleeping quarters. A reliable source of power is necessary and should be so arranged that any interruption will not make the alarm system useless.

The system should be arranged for periodic tests of the circuits by means of a manually operated switch which produces an alarm and automatically restores the system to its normal position when released.

In line with the present trends by manufacturers to produce small automatic fire detection and alarm systems for private dwellings, the F. Cecil Brown Company of Los Angeles has recently marketed a simple, easily installed system which should be effective for its purpose. The system is known as "Savealife" fire alarm. It was apparently designed for the private residence, but has application for numerous types of occupancy, among which the following are but a few: hotels, dormitories, clubs, schools, apartments, motels, trailers, and theatres.

The system consists of fixed temperature thermostats (135°F. and 165°F.) and alarm bells connected through a two wire circuit to a 110-A.C. transformer and the main power supply. Power supply

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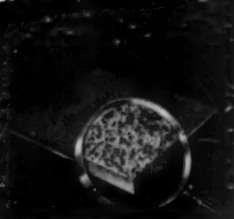

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may either be 110 A.C. or 6-volt "hot shot battery." Thermostats are strategically located in all important rooms or danger spots. Warning bells are located so they will awaken some member of the family. An alarm bell can also be provided on the outside wall to warn neighbors of trouble in case the occupants are away.

The system is not supervised; all maintenance and tests would have to be done by the owner.

Volunteer Alarm Systems

Next in importance to prompt fire detection is getting the firemen on the scene. In our cities, where men are always on duty in the fire houses, this is no problem. But, in communities where fire fighting is done by volunteers, the problem is different.

Realizing the necessity of promptly calling the men, the Line Materials Company of East Stroudsburg, Pa., developed a special call system, utilizing power and light feeder lines for transmitting signals. The system is known as the "L. M. Wired Radio Volunteer Fire Alarm Call System." It is designed to transmit coded signals automatically over the power and light feeder lines of the local electric power plant and will ring bells and/or operate flashing lights in the homes, places of business, or other locations of the volunteer firemen.

The system conisists of a transmitter installed in the electric power plant coupled to the electrical distribution busses to send out signals which will be transmitted over the power and light feeders, through the distribution transformers into the various homes of the volunteer firemen.

In the homes, a small special portable receiver can be plugged into any 115-volt electrical outlet. The unit will translate the coded signals into strokes on a bell or into light flashes which will reproduce the fire box signals, as transmitted by the particular fire alarm box which was pulled.

Relays in the wired radio transmitter and connections to the existing fire alarm circuits will provide for automatic transmissions, without delay, of the fire box signal as it is received at fire headquarters. If a community has no public fire alarm system, arrangements can be made to summon the firemen through a connection from police headquarters to the transmitter in the power station, thence over the electric system to their homes.

Rockville Center, Long Island, is the first United States community to install this system. It has been reported by the firemen that many minutes are saved on each call in getting to the firehouse since this system went into service than when summoned by the conventional siren.

Small Communities

The present method of handling emergency telephone alarms in small villages, where there is no public fire alarm system, has been a much discussed subject for a long time. It was submitted to the N.F.P.A. Committee on Signalling Systems and Thermostats in 1948 for study, and since that time the problem has been carefully studied by engineers of the American Telephone and Telegraph Company. They have worked with their various departments and have formulated a more satisfactory method of promptly handling these alarms than heretofore. The method will be published as a Special Interest Bulletin by the N.F.P.A. in the near future.

In conclusion, we in the business of protecting life and property from the hazards of fire, are all in agreement that the prompt receipt of a fire call is the first step in its extinction.

We have our public fire alarm systems, but not in every community. We have fire detection systems, but their use, for one reason or another, has not been extensive. To overcome this and to encourage a wider use of detection devices and instant fire fighting procedures requires the untiring efforts of all public spirited persons and organizations to continually educate our people of the benefits a fire detection system will bring them.

Static Electricity

(From page 25)

ble substances.

When liquids are agitated with air or other gases, static electricity is generated by the breaking through of the gas to the surface and the bursting of the bubble film. Compressed air issuing from a pipe or hose, especially from pinholes in sand-blasting and compressed-air hose, generates static electricity. If the air impinges on an insulated body, the object will accumulate a heavy charge.

The National Fire Protection Association states: "While the application of paint, varnishes, enamels, lacquers, and other finishes by the spray method may generate small charges of static electricity, actual experience indicates that the hazard is not at all acute."[5]

When carbon dioxide is discharged from an industrial cylinder, static electricity can be generated. Because the horn on the early type carbon dioxide fire extinguisher was not electrically connected to the extinguisher, static electricity accumulated on the horn.

Steam flowing through and from the end of a steam hose can generate static electricity. Steam from leaky joints has caused heavy charges to accumulate on nearby insulated objects. All steam pipes and nozzles through which steam flows should be electrically bonded to objects being steamed, and the whole system should be grounded.

"The action of dipping, or rinsing garments in flammable liquids causes the liquids to vaporize and throw an extended blanket of highly flammable vapors in all directions. It is commonly believed that home dry cleaning in the open air is entirely safe. In the open air, however, there is a distinct danger of static electricity being generated, and subsequently igniting the vapor clouds of the liquids, with disastrous results. Volumes have been written about the hazard of cleaning in the home, and yet records show over 700 deaths and many injuries a year, mostly to women and children, from this

dangerous practice.

"Static sparks are easily generated by dipping, rinsing or wringing fabrics in gasoline or other highly flammable liquids. The hazard of ignition by static electricity in commercial dry cleaning plants can be mitigated by grounding or by humidification. There is, however, no way of mitigating the hazard of home dry cleaning with flammable liquids. Numerous proprietary cleaning liquids, some of which are entirely nonflammable are available, and if cleaning must be done at home, only a non-combustible liquid should be used."[5]

In each case, static electricity is generated whenever dissimilar materials contact each other and separate. If an insulated body is near, it may accumulate a sufficient charge to cause a spark.

As most of us have been taught that static electricity is generated by friction, many probably will not agree readily to the contact and separation theory. It is easy to prove that static electricity is due to contact and separation and not to friction. The metal disk (Fig. 2) is placed against a flat, insulated piece of plastic, such as Lucite, care being taken to insure that the disk does not slip.

If the disk is drawn away and passed within half an inch of a round, insulated metal plate, a charge will be induced upon the plate. On the plate is the specially constructed explosion tube containing a flammable mixture. After the procedure has been repeated two or three times, sufficient charge will accumulate on the plate and tube to cause an explosion when the ungrounded terminal is touched and a spark occurs inside the tube.

Many fires have occurred when gasoline or other volatile flammable liquids were dropped into tanks. A few years ago two physicists were called to a refinery to determine the cause of long static electrical sparks in a tank of lubricating oil. The oil dropped from the pipe elbow through an opening in the top of the tank, causing sparks sometimes 10 feet long across the surface of the oil in the tank.

To eliminate the sparks, the physicists placed a wire-mesh

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basket across the opening in the tank and bonded the basket to the tank and the lubricating-oil pipeline. The screen broke the oil stream into many small streams, causing heavier accumulations of static electricity to occur in the tank. A chain was connected from the center and bottom of the wire basket to the bottom of the tank. This did not eliminate the sparks either: it caused more and shorter ones because the grounded chain became another terminal.

The only way the sparks were eliminated was by extending the outlet of the pipeline to within a few inches of the bottom of the tank, filling the tank from the bottom instead of the top.[3] This method will not eliminate static accumulations if the flow causes turbulence within the tank.

To prove further their theory of contact and separation, the physicists tested it on a wide belt run over two pulleys. One pulley was equipped with ball bearings to eliminate as much friction as possible. As static electricity is found on the take-off side of a pulley, they measured the amount on that side. Brakes were then applied to the free-running pulley, causing the belt to slip. They found that less static electricity was generated with the slipping belt than with the free running one.

When raindrops separate from a cloud and fall to the earth, they leave one charge on the cloud and bring the opposite charge to the earth. What is true of rain is true of most liquids. Pure water is an insulator. Thus, it might appear that if a liquid is a conductor it is not a generator. This is not the case; mercury is as good a generator as water, as the following demonstration proves.

Two glass funnels are set up—one an ordinary V-shaped and the other a separatory funnel. Platinum wires extend through the glass stem of the V-shaped funnel and through the bottom of the separatory funnel so that the wires are in contact with the mercury flowing through the funnels. The V-shaped funnel is placed at the top with the stem extending into —but not touching—the separatory funnel.

Over the end of the stem of the top funnel is tied a piece of unstarched muslin so that the mercury will spray into the separatory funnel. The funnels are in a plastic case to prevent dust and smoke particles from accumulating on them and dissipating the charge as it is generated. From the platinum wires fused into the funnels, the electric conductors extend through the plastic case and are connected to the insulated metal plate and the ungrounded terminal of the explosion tube.

Less than a teaspoonful of mercury flowing through the funnels and cloth generates enough static electricity to ignite the flammable mixture in the tube. An ordinary fluorescent tube will flash if touched to the terminals of the conductors from the funnels. This experiment also proves that the separation of particles generates static electricity.

Electrical bonding eliminates accumulations of static. The possibility of a static spark occurring in the tube can be eliminated by insuring that all bodies on which a charge can accumulate have the same electrical potential, that is, they are electrically bonded. This can be demonstrated by bonding the ungrounded terminal of the explosion tube to the plate. When the tube terminals are connected to the mercury funnels, no spark occurs in the tube, regardless of the quantity of mercury that flows through the funnels.

"A tank car was being filled with a colored grade of gasoline through a fabric loading spout hanging through the center of the dome opening and reaching to the bottom of the car. Dye solution was being added through a small metal-lined hose hanging beside the fabric spout. An explosion occurred shortly after the filling had started.

"It is thought that a static charge built up on the fabric spout and jumped to ground to the coupling on the end of the metal-lined hose. The fabric spout had been adopted for use at this location following a previous fire that had been caused by a stray current producing a spark between a metal spout and the car dome when a locomotive bridged the insulated joint in the spur track."[6]

Probably both fires would have been prevented if the metal lining of the original hose had been properly bonded to the car and the track.

Water falling into or through or passing an insulated metal body may cause an accumulation of static electricity on the body. A water solution was being circulated by pumping it through a pipe with an outlet at the top of an opening in a horizontal, 3/8-inch sheet-metal tank, 9 feet in diameter and 20 feet in length. The water solution dropped approximately 6 feet. The tank contained a flammable hydrogen atmosphere.

No one was near when an explosion occurred in the tank. The officials who heard the explosion gathered around the top opening; 15 minutes after the first explosion, a second occurred, blowing the solution on the officials. Tests showed that the solution pipeline and the tank were bonded and well-grounded. It is believed that the falling water created a miniature thunderstorm inside the tank.

"An 1100-barrel refinery run tank containing a second cut gasoline had been emptied to a low gauge preparatory to changing products. In order to float out the remaining gasoline, a water stream was directed through the gauge hole by means of a fire hose without coupling. The end of this hose hung about two feet into the tank. About two minutes after the gauger had turned the water on and left the scene, the tank exploded. "Static seemed to be the only possible explanation for the ignition, it being presumed that a charge built up on the oil surface by the agitation had jumped to ground, possibly through the water stream. We are now insisting that water enter the tank below the oil surface."[6]

The generation of static electricity by falling water can be dem-

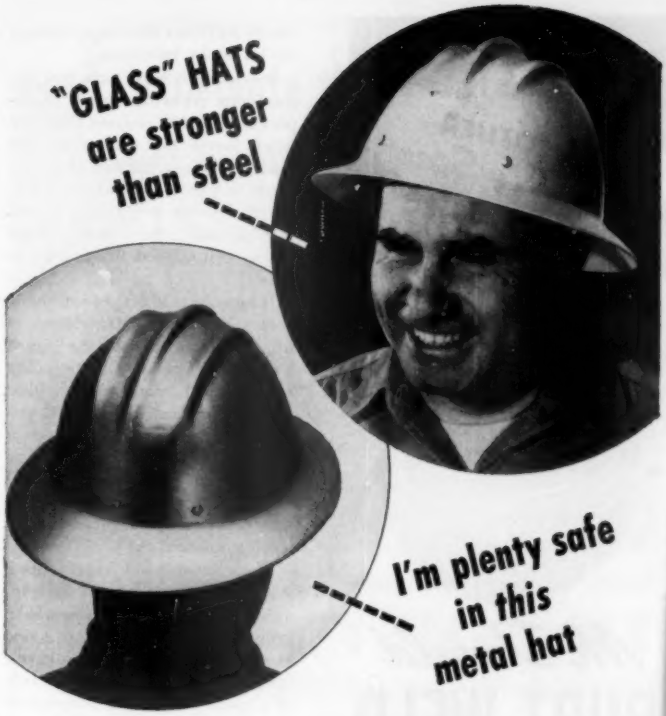
onstrated with a Kelvin water dropper. This consists of four small tin cans with the bottoms and tops removed. To collect the charges from the water, a wire screen is installed across and near the bottom of each of the lower cans. The bottom can on each side is electrically connected to the top can on the opposite side. Collector points on the top cans cause the charge that accumulates on the cans to flow to small collector disks, which are electrically connected to the explosion tube and metal plate.

As water flows from the small nozzles (1/16-inch opening), it is broken into droplets which pass through the top cans onto and through the wire screen in the bottom cans. About 3 tablespoonfuls of water generates enough static electricity to cause an ignition in the tube. If all the cans were bonded, a static charge could not be generated. This again stresses the need of following the grounding and bonding requirements set forth in the National Electrical Code.

Many persons, especially service station attendants, have received electric shocks when they touched an automobile that had just been driven. An automobile or tank truck accumulates a static charge in two ways—from the contact and separation of dust and moisture particles in the air stream or from the contact and separation of the tires and the pavement.

During the dust-bowl days in the Panhandle of Texas and Oklahoma, many automobiles driven in duststorms accumulated such strong charges that the motors stopped. In such a case when one end of a tire chain was placed on a bumper or fender and the other end in the dirt, the charge drained off and the motor started. One theory as to why the motor stopped is that the static charge was so strong that the spark coil could not develop sufficient potential to create a spark that would ignite the gas in the cylinders.

As the tire tread separates from the pavement, a positive charge is left on the pavement and a negative charge is carried on the tread.[7] After the tread attains a high potential, static electricity leaks to the car body through the



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wheels by direct discharge through the air or by induction.

It is of interest to note that the maximum potential occurs at approximately 130 degrees after the tread leaves the surface of the road. These charges can give electrical shocks to passengers entering or leaving a car and, in the case of tank trucks, have caused sparks that ignited flammable vapors.

It appears that the generation or accumulation of static electricity would be prevented by the use of a drag chain or by using tires that are electrical conductors. Neither of these methods has proved satisfactory because most modern pavements are good insulators. The tested roads had resistances of 100,000 ohms or more.[7] Such surfaces compare favorably with electrical insulators.

The only sure way of preventing static sparks from a truck from igniting flammable atmospheres is to ground the truck properly in a safe atmosphere before transferring operations are started. The hazards of a spark and the effectiveness of grounding or bonding the truck to the tank can be demonstrated with a miniature truck and a miniature liquefied-petroleum-gas tank. (Fig. 3.)

A static charge is placed on the truck; as it backs toward the tank, a spark passes to the tank, igniting the vapors issuing from the tank. The truck is charged again. This time it is bonded to the tank. As the tank and truck are at the same potential, no spark develops when the truck backs toward the tank.

Just before the gates on some toll bridges are grounded steel fingers extending up from the pavement. The grounded fingers remove enough of a static charge so that neither the driver nor the gate attendant will receive an electric shock. This method, however, is not effective for protecting trucks at loading and unloading docks.

A charge placed on the miniature truck is discharged; however, when several persons join hands and the two end persons touch the truck, everyone receives a shock. This proves that a continuous bonding contact is required and that an instantaneous contact will not completely dissipate the charge, just as turning a bucket of water upside down for an instant will not drain all the water from it.

In an Oklahoma refinery steam escaping from a flange connection between a valve and the pipe impinged on a metal sign under the valve. The sign was suspended on metal straps around the pipe insulation. The top of a strap was ¾ inch from the head of a flange bolt. A spark traveled across the ¾-inch gap at 3-minute intervals, sometimes arcing two or three times before the charge was dissipated.

A gasoline tank truck parked in a service station accumulated a strong static charge. A test run on an asphalt pavement failed to produce a similar charge. Investigation revealed that steam leaking from a pipe to a pressing machine in a tailor shop was carried across the truck; however, the white cloud of steam disappeared before reaching the truck. In experimenting to reproduce this charge, it was found that steam at a pressure of 75 pounds per square inch escaping through a 1/16-inch hole generated enough electricity to charge the truck.[3]

At a large refinery on the Gulf coast a 55,000-barrel crude-oil tank was being steamed preparatory to cleaning. After several hours the steam was shut off and tests disclosed an explosive atmosphere in the tank. The steam was turned on again into the tank, and about 20 minutes later an explosion damaged the tank.

The writer believes that a static spark ignited the flammable mixture in the tank. The static electricity could have been generated in at least two ways: The steam condensed on the top, and the drops of water fell into the bottom settlings; or miniature storm clouds formed, and a spark developed between two clouds or between a cloud and the tank.

Lightning-Proof Tanks

Steel tanks, with steel roofs, are considered to be self-protecting against lightning discharges if they conform to the following specifications:[2]

1. All joints between steel plates riveted and calked, or welded. (Author's note: At a large refinery in Oklahoma it was necessary to electrically bond across practically every plate of a re-

built tank to prevent sparks' traveling from plate to plate.)

2. All pipes entering the tank electrically connected to the tank at the point of entrance.

3. All vapor or gas openings closed or flameproofed.

4. The metal tank and roof to have adequate thickness, so that the holes will not be burned through by lightning strokes (3/16-inch roof sheets on tanks have proved adequate).

5. The steel roof to be in intimate electrical contact with the tank or else well bonded to the tank.

Steel tanks with floating metal roofs, the roof being thoroughly electrically bonded to the tank and the tank otherwise conforming to the above specifications, are considered to be self-protecting.

These conditions can be demonstrated by having miniature lightning strike a miniature tank. So long as no flammable vapors escape, nothing happens. When flammable gas escapes from the vents, it is ignited. If the tank were on a wooden, oil-soaked platform which insulated it and the pipes were not electrically connected, lightning would arc at the ground and probably would set fire to the platform.

If a pipe is electrically connected to the tank, lightning might travel along the pipe and cause a fire or an explosion at a distant point. This can be shown by connecting the tank to the ground through the terminals of the explosion tube. When lightning strikes the tank, it causes a spark which ignites the flammable mixture in the tube.

Steel tanks with non-vaportight roofs or with wooden or other non-metallic roofs are not considered self-protecting, even if the wooden roof is covered with thin metal, making them essentially gastight.[2] This can be demonstrated by having miniature lightning strike a miniature tank with a leaky roof. Such tanks should be provided with lightning rods or with air terminals of a sufficient height and number to receive all strokes or to dissipate the ground charges. The air terminals should be bonded correctly to each other, to all metal of the tank, and to all metal bodies within a radius equal to the height of the air terminals.

The protection furnished by air terminals can be demonstrated by placing a ring of air terminals on the leaky roof of the miniature

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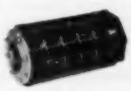

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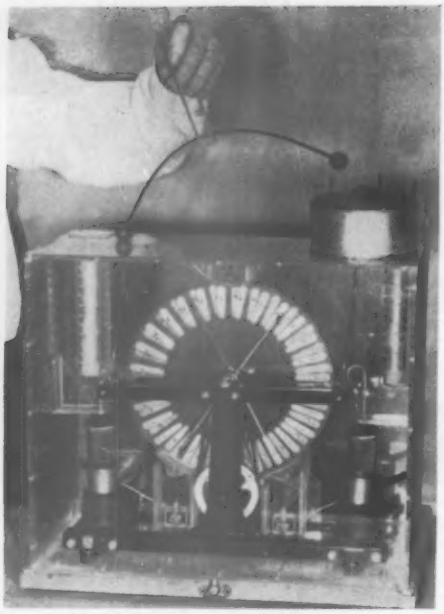

Figure 4. Oil tank protected with lightning rods.

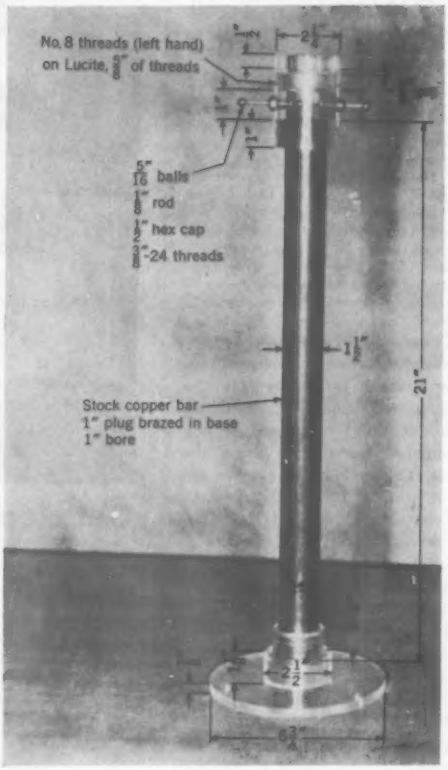

Figure 5. Tube for igniting flammable anesthetic and air or oxygen mixtures with static sparks.

tank and endeavoring to make the miniature lightning strike the tank. (Fig. 4.)

Protection of buildings from lightning is based upon the same fundamentals as those for oil storage. It is not true that lightning will always strike the highest object. Where and what it strikes depend upon many factors, some of the most important are the direction of the storm, the ragged cloud area, and the conductivity of the object. These facts can be demonstrated with a miniature house.

Where the miniature lightning strikes depends upon the direction of the cloud's approach. If the house were a building from which hot or petroleum gases were escaping, the lightning would tend to strike the building at the point where the gases were escaping. Such gases often tend to decrease the dielectric strength of the atmosphere above and around the building. If enough gas is present to form a flammable mixture, the lightning will ignite it.

All types of buildings can be protected by proper installation of so-called lightning rods and other approved lightning-protection equipment. Underwriters' Laboratories, Inc., has approved lightning-protection equipment manufactured by several companies.

Bureau of Standards Handbook H 40, "Code for Protection Against Lightning," contains the specifications for the materials, construction, and installation of lightning-protection equipment. A few of the specifications that must be complied with are: The conductor must be of the proper size; the bends of the conductors must not exceed 90 degrees or have a radius of less than 8 inches; there must be not fewer than 2 down-conductors with a ground connection for each; air terminals must be provided for all structural parts; the tip of the air terminal point must be at least 10 inches above the object to be protected; and on flat roofs, the terminals must be higher than 10 inches but not over 5 feet.

The effectiveness of lightning protection can be demonstrated by installing lightning rods on the miniature house. When the charged cloud approaches the house, no stroke of lightning occurs. The glow of the neon tube in the front window shows that the points of the lightning rods are dissipating the ground charges and preventing a lightning stroke. If the ground connections are poor or broken, the lightning rods will not be ef-

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fective, and lightning will strike the object.

It has been found that lightning flashes in the immediate vicinity of cotton and other flammable, fibrous materials baled with metal ties may cause discharges of sufficient intensity between the ties to cause ignition. To prevent fires of this type a greater degree of shielding is required than that afforded by the ordinary system of lightning rods.[2]

Anesthetic Explosions

During 1947 there were at least two explosions of anesthetic that resulted in the death of two hospital patients. In 1943 the Bureau of Mines published Technical Paper 653, *Explosion Hazards of Combustible Anesthetics*,[8] and in 1944 the National Fire Protection Association published a pamphlet entitled *Combustible Anesthetics in Hospital Operating Rooms*.[9]

Operating rooms in many old, remodeled, and some new hospitals do not comply with the recommendations contained in these publications. The reason for the non-compliance is that few people realize how easily static electricity may be generated or know of the explosive power of anesthetics.

The violence of an anesthetic-oxygen explosion in an operating room or in a patient's mouth, throat, and lungs can be demonstrated with a specially constructed tube. (Fig. 5.) The tube has a capacity of 16.5 cubic inches, approximately 2/3 of the amount of air (25-30 cubic inches) inhaled by a man at rest. The tube is filled with oxygen, and 0.15 c.c. of ether is placed in the tube. The opening in the tube is sealed with a paper diaphragm.

A static charge is generated by rubbing the plastic rod with paper or cotton cloth. This is similar to rubbing nylon or silk against a cotton uniform. The charge is induced on the copper tube by moving the plastic rod close to the tube. Similarly, a person carrying a charge can induce one on another person whom he passes near or touches. When someone touches the ungrounded terminal of the tube, a violent explosion occurs. Table 1 gives the flammable characteristics of the more common anesthetics.[10]

All electrical equipment in an operating room should conform to the requirements of Article 500 of the National Electrical Code. The floor should be of electrically conductive material which should extend at least 10 feet outside the door of the room. Furniture should be of metal or some other electrically conductive material. The coverings of operating tables, stretcher pads, pillows, and cushions should be of conductive material.

All rubber tubing, such as masks, breathing bags, gaskets of anesthesia equipment, and suction and pressure tubing not confined within metal sheathing, should be of electrically conductive material. Shoe soles should be of conductive material. Wool, silk, synthetic textiles, and plastics should not be allowed in locations where there are flammable anesthetics.[8]

Care should be taken to insure that everything in the operating room is electrically bonded. In addition, on the doors of the operating room there should be a grounded, stainless steel or other suitable metal plate that will be touched by each person, stretcher, or other object passing through the door.

The National Fire Protection Association states:

"In hazardous locations and in locations of limited hazard where the electrical characteristics of the floor do not meet the specifications of this section, or where persons and objects are not in electrical contact with a common conductive medium, some other suitable means should be provided for the intercoupling of those persons and objects most likely to be in the region adjoining the anesthesia machine. Some approved form of high resistance intercoupling should be used. This should be so arranged as to maintain a conductive path between any two bodies of the intercoupled group, or between any one body of this group and ground, the resistance of which is not less than 200,000 ohms nor more than 1,000,000. Any intercoupled system should include the patient, the anesthetist, the operating table, and the anesthesia machine."[9]

Bureau of Mines Technical Paper 653 states: "A summary of the laboratory and clinical investi-

gations given in this report proves rather conclusively that satisfactory non-flammable anesthetic mixtures can be obtained by the addition of helium in sufficient amounts to cyclopropane and oxygen, and cyclopropane, ether, and oxygen mixtures."[8]

The effectiveness of a helium-oxygen mixture can be demonstrated by filling the copper tube with a mixture of 15 per cent oxygen and 85 per cent helium and adding 0.15 c.c. of ether. A static spark will not ignite this mixture; the flame of the match will cause slow burning. Various oxygen-helium mixtures are used in the treating of asthma and other lung disorders.

For static electricity to ignite flammable materials, three conditions must exist simultaneously:

1. A means of generating static electricity
2. Accumulation of a static charge
3. A spark in contact with a flammable substance

Preventing Accumulation

In many industries it is not possible to eliminate the generation of static electricity and the accompanying sparks, but accumulation of static electricity can be prevented by one or a combination of the following methods:

1. Bond or ground all metal objects.
2. Maintain relative humidity of atmosphere high enough (probably between 60 to 80 per cent) to insure that a conducting film of moisture is adsorbed on the surface of solid insulating materials. (Oil is a good insulator, and an oil film between a shaft and its bearings or other objects may have enough resistance to prevent flow of static electricity).
3. Neutralize static electricity as it is generated by providing a supply of oppositely charged ions. This procedure is exemplified by the lightning rod, grounded comb or points, gas flame, and the "electric neutralizer."

The electric neutralizer consists of a row of sharp metal points connected to a transformer or other source of high potential of at least 10,000 to 15,000 volts. Recently there has been placed on the market a new type of static eliminator which consists of a strip of silver or gold impregnated with radium mounted in a durable bar of aluminum, usually about 1½ inches wide and of various lengths. This bar is mounted so that a predetermined field of ionization can be directed at a point

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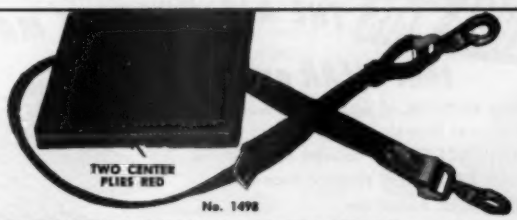

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Industrial Health

(From page 60)

cologists because of the very wide occurrence of the element in trace amounts. In industry it has been encountered primarily in the handling of cryolite and in the use of fluorides as pesticides. More recently the industrial development of fluorine compound has been tremendously expanded because of the demand for greases, lubricants and heat exchange materials chemically inert and resistant to high temperatures and high pressures.

Earlier work had indicated that

fluorine was not essential to either plant or animal life but more recently there is evidence that small amounts may be necessary.

The effects of fairly small amounts of fluoride taken into the body over a long time has been recognized in the syndrome which has been called fluorosis. The best known effects are those in the teeth which become mottled and which are destroyed by pitting and erosion if the amount taken is too large. This condition is seen very widespread in regions where the drinking water is abnormally high in fluorides (above about 5 p.p.m.). At the same time excessive fluorine intake may lead to brittleness of bones and to calcification of ligaments and tendons.

The effect of fluorides in reducing the amount of dental decay has aroused more general interest than any of its other physiological effects although this is not actually a toxic manifestation. It has also been shown that the incidence of poliomyelitis is relatively low in areas where the drinking water contains a high concentration of fluorides.

It has generally been considered in the past that organic compounds of flourine were less toxic than the inorganic compounds. Recently several new organic fluorides have been introduced which are extremely toxic. Examples are 3-fluorotyrosine, diisoproply fluorophosphate and fluoroacetic acid (1080).

The mechanism of action of these very toxic organic fluorides has been investigated with considerable care. Their extremely high toxicity appears to arise from the fact that they interfere with enzyme systems in the body. The diisopropylfluorophosphate is known to inhibit the action of the cholinesterase of nervous tissue. This enzyme is presumed to be important in the chemical transmission of the nervous impulse. The inhibition appears to be irreversible when once accomplished and there is some evidence that it amounts to a true chemical combination between the enzyme and the diisopropylfluorophosphate.

Fluoroacetic acid is generally believed to function as a metabolic antagonistic for acetic acid

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Made in four types as shown below, the welding goggles have 50 mm. lenses in shades from 3 through 6, with cover glasses for protection. The grinding goggles have clear hardened lenses only. Jackson Products, Warren, Michigan

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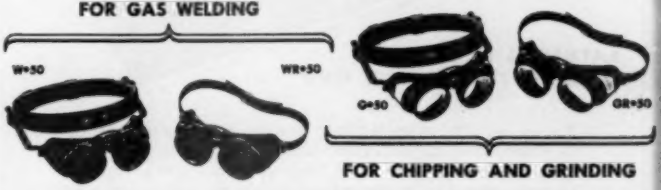

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through some methanism not known. It has been shown, however, that fluoroacetic acid does prevent the oxidation of acetic acid in the organism.

In addition to these two specific instances fluorides are known to be inhibitors of a large number of enzyme of which the mechanism has not been worked out at all completely. It is also known that extremely low concentrations of fluorides have the opposite effect of activating the enzyme systems or, at least, of activating the enzymatic reactions.

Lung Cancer

Pulmonary Carcinoma in Chromate Workers. I. A Review of the Literature and Report of Cases. II. Incidence on Basis of Hospital Records, by Anna M. Baetjer. The Archives of Industrial Hygiene and Occupational Medicine. 2:487-516 (November, 1950).

In only a few instances has it been suggested that a non-radioactive metallic compound was a factor in lung cancer. The first cases of lung cancer attributed to chromates were observed in Germany in 1911 and 1912 but were not reported in the literature until 1932. Between 1932 and 1947 there were at least 52 cases of cancer of the respiratory tract in the German chromate producing plants. There are no data on death rates due to lung cancer or on the incidence rate of lung cancer in chromate workers as compared to other workers in Germany.

In this country Machle and Gregorius published a study of the deaths from cancer of the respiratory tract in the chromate-producing industry. This group showed a rate of 21.8 per cent of all deaths were due to cancer of the respiratory system in the chromate producing industry as compared with 1.4 per cent for a control group of industrial workers in other industries. For cancer other than of the respiratory tract the rate for the workmen in the chromate producing industry was not significantly different than that from workmen in industry in general. This group included 42 deaths from cancer of the respiratory tract.

Other investigators have reported 15 additional cases in this country and one case each in Switzerland and England. This with the German cases makes a total of 122 cases of cancer of the respiratory tract among workmen with an occupational exposure to chromium compounds, 109 workers in the chromate-producing industry, 11 in the chrome pigment industry and 2 in other industries.

The length of exposure to chromate varied greatly. The shortest recorded period was four years of employment and the longest 47 years. The average duration of employment in the German cases was 22 years and in the United States cases 16 years.

The cases of lung cancer occurred mostly in older men with an average of 52 years of age for the United States cases. One case in Germany was in a 29-year old man and two in the United States were in men below 35.

There are no data to indicate the amount of chromate dust to which the men were exposed prior to developing the lung tumors. In the American plants variations from

The commonsense way to
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SAFE, NON-POISONOUS SKIN TOUGHENING TO COUNTERACT THE SOFTENING EFFECTS OF WEARING SHOES

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BATHERS LIKE ONOX
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Recent research has upset former theories regarding the control of Athlete's Foot. ONOX is revolutionary. A safe, non-poisonous skin toughener does the work. You may test it under any conditions you choose to impose and without obligation. For example:

● *We will ship prepaid, your trial order for any amount of ONOX and equipment. Use it for 60 days. If at the end of that time ONOX has not proved itself to your complete satisfaction you owe us nothing.*

We would like to send you the simple details of the ONOX method now used by hundreds of institutions—coast to coast.

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Important: Did you note the "Radical reversal of medical teaching" in TIME Magazine? A report based on 10 years observation by 91 U. S. Skin Specialists calls Foot Baths "Futile"—"Illogical"—"Potentially harmful." Onox on the other hand is a safe, non-poisonous skin toughener. IT STEPS UP RESISTANCE . . . INSTEAD OF BREAKING IT DOWN! Try the Onox way. You'll be surprised!

(Copy of TIME article sent on request.)

0.01 to 21.0 milligrams of chromium per cubic meter of air have been reported. Analyses of blood and tissues of chromate workers with and without cancers have not revealed any significant regularities.

There is some evidence that monochromates are more important in the production of cancer than are bichromates.

In order to get a somewhat different statistical picture of the incidence of lung cancers in the chromate industry it was decided to study the distribution by occupation of lung cancer cases in the Baltimore hospitals in comparison with the distribution by occupation of other types of cases in the same hospitals. In this series only cases are included which have a diagnosis of cancer of the lungs or bronchi confirmed by histo-pathological examination.

Eleven of the lung cancer patients in two hospitals in the past 15 to 20 years have had occupational exposure to chromium compounds and ten of these had worked in a Baltimore plant producing chromate. No patients in any control groups had reported any occupational exposure to chromium compounds.

Statistical analysis indicated that the percentage of lung cancer patients who had been exposed to chromates was significantly higher than would be expected on the basis of the control groups. The size of the difference and the precautions taken to eliminate the possible coincidental errors in the statistics make it unlikely that these statistics do not indicate a real tendency toward lung cancer due to exposure to chromium compounds.

Auditing Industry's Medical Services

(From page 64)

as progress can make them. The sharp eyes of the workers will soon detect inefficiency — which will have a tendency to lower their morale.

The medical department should be located nearest the spot in the plant where the case load is greatest, so that injuries may be treated quickly and effectively. A simple check on calls can be made by

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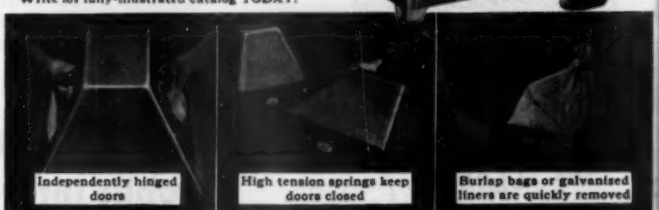

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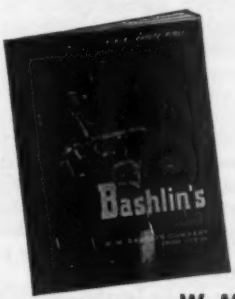

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W. M. BASHLIN CO. Grove City 3, Pa.

It will not slip . . . withstands weight of heaviest cars . . . Saves time in moving up—no blocks, ties or shims necessary.

The M & M Rail Clamp is made in two sizes to fit any rail, worn or new—Model A, 40 to 100 lb rails; Model F, 110 to 175 lb. rails.

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listing the ten most frequent occupational calls and the ten most frequent non-occupational calls. If their significance is analyzed, and if the work areas from which they come are plotted, much valuable information for the correction of dangerous conditions can be obtained.

Examination and dispensary procedures should be considered next. One should determine, first of all, whether the facilities are adequate, for without them, the examinations will suffer. Let us take a quick look at dispensary work. This should be done in a routine manner established by standing orders and protocol. Here a friendly warning should be issued to physicians who may forget the high standing of their profession, and who are tempted to click off their patients as though running them through a production line.

For most industries, the only laboratory facility needed is a table where urine tests and blood counts can be taken. Blood serum samples can be sent to a local or state laboratory for analysis. But in those cases where a great number of toxicological tests are necessary, or where complicated procedures are called for, such as the determination of the amount of lead in urine, it is usually more expedient and economical to set up a complete laboratory in the plant.

Record analysis should be periodic. For the sake of brevity and efficiency the examiner should check whether all forms are useful. It is also wise to find out if monthly, quarterly, or yearly tabulations are made, and whether these tabulations reveal unusual or significant circumstances pointing to disease or injury incidence. For a complete check, direct and indirect medical service should be compared, and the percentage of each noted. Before the examiner can say his audit is completed, he should practice what he preaches and visit each department in the plant to note each operation, and in what manner these operations could lead to hazards.

If a four-high, five-stand sheet mill breaks down, management knows immediately what to do—get a new one, so that production can be resumed, and damn the expense. We here at the Foundation are concerned with the human machine, and want to keep it in such condition that it never breaks down. That is why we have set our sights so high. That is why we propose to keep them there.

I have seen large companies, which could well afford the best of medical service, limp along with accident treatment as the only medical service available to workers. And I have seen small companies, with a necessarily limited budget, practice the very best of industrial medicine.

Council to Give Awards for Public Interest Promotion

The National Safety Council again is inviting nominations for its Public Interest Award as a means of honoring public information media which rendered exceptional service to safety in 1950.

Awards will be made in six categories—daily and weekly newspapers, radio and TV stations and networks, consumer and trade magazines, national and regional advertisers, outdoor and transportation advertising organizations, and theatrical motion picture producers.

The Public Interest awards are not competitive. They will be made only on the basis of exceptional service to safety as determined by a board of judges.

The board consists of Norman Damon, vice-president of the Automotive Safety Foundation; Dr. Frank Luther Mott, dean of the Missouri University school of journalism; Wesley I. Nunn, advertising manager of Standard Oil Co. (Ind.) and coordinator of the Advertising Council "Stop Accidents" campaign; J. E. Ratner, editor of *Better Homes & Gardens*; Robert K. Richards, director of public affairs for the National Association of Broadcasters; Miss

Judith Waller, Central division director of public affairs and education, National Broadcasting Co., and Dwight Young, president of the American Society of Newspaper Editors and editor of the *Dayton Journal Herald*.

Nominations may be self-made or by an agent of the nominee on official blanks obtainable from the National Safety Council, 425 North Michigan Ave., Chicago 11, before March 15, 1951.

The Council again will administer the Alfred P. Sloan Radio Awards for Highway Safety at the request of the Alfred P. Sloan Foundation. Information and nomination blanks may be obtained from the Council.

The Sloan awards, which are competitive, are in addition to the Council's non-competitive awards, and are concerned only with the radio contribution to highway safety. They will be selected by a special jury from recipients of the Council's Public Interest Awards.

Color in Industry

(From page 33)

ticularly suitable for eating places. Corridors leading to facilities and work places may be made to appear light and attractive if painted ivory or soft yellow.

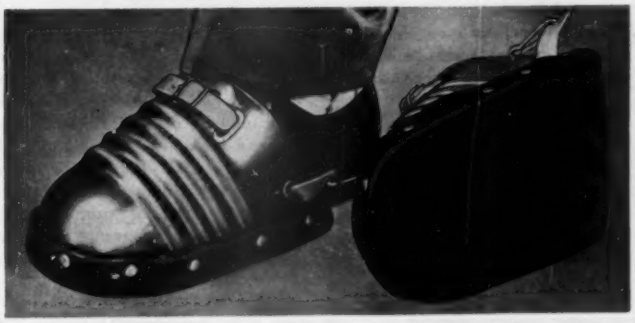
22. The type of light source should be considered in the selection of colors. Colors may appear quite different under different types of lights, and it is a good idea to view each color sample card in the place where the color is to be used.

23. Incandescent bulbs tend to reduce the strength and intensity of color because of a slight-yellowing effect from the light.

24. Fluorescent lighting is of three types, white, daylight, and soft white. Daylight units give a bluish hue and can be used with blue, blue-green, green, and blue-violet. Since orange is the complement of blue, the use of orange paint with this type of fluorescent light would give a muddy color.

25. White and soft-white fluorescent units produce a warm light suitable for ivory, cream, beige, rose, and tan. A neutral gray can be used with incandescent and

Are You Fully Protecting the Feet of Your Employees?



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Equipped with ANTI-SKID FULL SOLE

"SANKEY" FOOT GUARDS consist essentially of a metal shield to be worn over the shoe whenever the foot is in danger of being either crushed or cut. The metal shield is designed to furnish a maximum amount of protection to the entire front of the foot—not merely the toes alone, but also to the instep—against hazards from falling, rolling or flying objects, or from accidental tool blows.

"SANKEY" Foot Guards are now available with a full anti-skid rubber sole. This prevent dirt, gravel and mud from working around and between the guard and shoe, and provides perfect coordination between the shoe and guard. The full sole is comfortable to use and protects the shoe sole from wear. They are of special value for use in ice houses, on icing platforms, for track and road maintenance and for pneumatic spade, drill and tamper operators. Write for literature or a trial pair.

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Combination Foot-Shin Guard

Improved Foot Guard

Fibre Shin or Shin-Knee Guard

The DAV-SON SAFETY DIRECTOR

Flashing color, changeable letter display for your important safety messages. The most effective safety bulletin made.

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fluorescent or mercury light.

26. Various colors may be used satisfactorily with natural light. A cool color, such as blue, is suitable for a warm southern exposure. A tan or other warm shade offsets the effect of cold northern light. Gray may be used if light is predominantly from the east and green if it is from the west.

27. The type of light is secondary in the selection of colors for boiler rooms, where a green or other cool color is most desirable, or a refrigeration room, where a warm color should be used, and similar places.

Color Codes

28. Color is used so extensively in plants for safety purposes that various safety color codes have been developed by the American Standards Association. The use of standard colors for specific purposes eliminates confusion in identification of equipment and hazards and prevents misunderstandings of the meaning of different colors.

Identification of Hazards

29. The *Safety Color Code for Marking Physical Hazards and the Identification of Certain Equipment Z53.1* specifies uniform colors for marking physical hazards, for indicating the location of safety equipment, and for identifying fire and other protective equipment. Color, however, is not intended as a substitute for proper guarding of machinery, for elimination of hazardous conditions, or for training of employees.

a. *Red* is recommended for identification of fire protection equipment, such as fire alarm boxes, fire buckets or pails, and fire extinguishers, and for walls or supports on which extinguishers are mounted; flammable liquid containers (except shipping containers) on which the name of the contents should be stenciled; for lights at barricades and danger signs; for emergency stops on machines such as rubber mills, wire blocks, and flat work ironers; and for emergency stop buttons for electrical switches.

b. *Yellow* has high visibility and is recommended for marking hazards that may result in accidents from slipping, falling, and bumping into objects. Solid yellow, and stripes and checks of yellow and black, may be used to attract special attention. The top and bottom treads of stairways, low beams and pipes and crane hooks are places where yellow may be used effectively for caution. The combination of black and yellow stripes often is used on mobile equipment, such as tractors and industrial locomotives.

c. *Green* in combination with white, such as a green cross on a white background, is used to designate the location of first-aid and safety equipment. The location of stretchers, gas masks, and bulletin boards is identified by this basic color.

d. *Black and white*, and combinations of them in stripes or checks, are used for housekeeping and traffic markings. (See Figure 2.)

30. The use of three additional colors is proposed in a revision of this code under consideration as this data sheet goes to press.

a. *Orange* has special attention value and is proposed to highlight hazardous parts of machines or electrical equipment, such as exposed edges of cutting devices and the inside of removable guards and doors and covers to switch boxes.

c. *Blue* on signs is suggested to designate caution against starting or moving machines being worked upon. If this color is adopted, signs are to be located at the starting or power sources of elevators, electrical controls, valves, tanks, and similar equipment.

b. *Purple* is suggested to identify radiation hazards, such as radioactive

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This two-man team working with HILD Equipment gets oily, slippery floors really clean . . . and leaves the floor dry and slip-safe! When floors are scrubbed during working hours, machine operators need be asked to step aside for only 90 seconds or less . . . so speedy is HILD System Shower-feed Scrubbing and Vacuum Drying. HILD Equipment easily goes under and around machines . . . the danger spots where slippery oil and grease are thickest.

The same HILD Equipment performs many other plant clean-up jobs. With the Power-Scraper Attachment the HILD Floor Machine "dry-scrubs" rough, bumpy, grease-caked floors. Other attachments to wax, polish, buff, sand, grind or steel-wool floors of all kinds. The HILD Portable Vacuum "sweeps floors with air," dusts overhead pipes, cleans bins, walls, elevator shafts, etc. Get complete information!

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materials in rooms and containers. Yellow is to be used with purple for tags, signs, and similar means of identification.

Identification of Piping

31. The American Standards Association's Code "Scheme for the Identification of Piping Systems" likewise recommends the basic colors of red, yellow, etc., in a simplified plan for safe operation of piping systems. The code does not apply to pipes buried in the ground, pipes used in electric conduits, or piping which carries solids either in gas or air. The contents of pipe are classified as follows:

Classification	*Color*
Fire protection	Red
Dangerous	Orange or Yellow
Safe	Green
Protection materials	Bright blue
Valuable materials	Purple

32. The proper color may be applied the entire length of the pipe or in bands 8 inches to 10 inches wide near valves, pumps, and at repeated intervals along the line. The name of the specific material is stenciled in black at readily visible locations at valves, pumps, and similar places.

33. If the background is a dark color, a rectangular portion of it can be made light with aluminum paint and the name stenciled in the light-colored rectangle. Piping less than ¾ inch in diameter is identified by enameled-on-metal tags.

34. Color stripes painted at the edges of the color bands may also be used to identify the exact contents of lines, but this method is less satisfactory than use of stenciled identifications. Labels for marking piping, which conform in color and size of letter to the code, are on the market.

35. Acids and alkalis cause many paints to change color. Therefore, paints exposed to moisture and chemical action should be carefully selected.

36. Orange-chrome yellow is fast to alkalis but not to acids or sulfur. Yellow ochre, however, may be toned up with bright yellow to a shade known as golden ochre, which is fast to sulfur. Because of its stability and low price, golden ochre may be used for a fast yellow where chrome yellows cannot be used.

37. Toluidin red is very fast to aqueous acids, alkalis, and sulfur.

38. Green is a chrome oxide toned with a little yellow. It is fast to everything and useful under extreme conditions.

Signs

39. Accident prevention signs and decalcomanias are among the oldest and most widely used safety measures in industry. Uniformity in the color and design of signs is essential so that confusion will be avoided and reaction to them will be automatic, regardless of whether or not an employee can speak English or is color-blind.

40. The American Standards Association's Code *Specifications for Industrial Accident Prevention Signs Z35.1* specifies *red* for signs warning of special dangers; *yellow* for caution of possible dangers or unsafe practices; *green* for

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DAVENPORT wooden sole shoes are resistant to heat, water, dust, oil, and acid. They give proper foot arch support and complete protection with comfort. Used on wet, cold, slippery or intensely hot floors, wooden soles are superior to leather, composition, or rubber soles. Wooden sole shoes cost much LESS, and wear much LONGER.

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safety instructions; *black* for directions such as those to stairways and exits; and any color except red or yellow for informational signs.

41. Other basic sign colors, blue and purple, have been suggested in the proposed revision of the "*Safety Color Code for Marking Physical Hazards and the Identification of Certain Equipment Z53.1*" (See paragraph 30.)

42. The code specifies the design of each type of sign in detail. For example, a danger sign has a white background covering the face of the sign. The word DANGER appears in white letters on a red oval. The red oval is placed inside a black rectangular panel with a white line separating the outside edge of the red oval from the adjacent edge of the black panel. The danger panel is at the top of the sign, and the wording for the specific hazard is in black letters on the white background. (See Figure 3.)

43. The regulations of the Interstate Commerce Commission require the use of color on labels to identify shipments of dangerous substances. Flammable liquids, for instance, such as alcohol and benzol, are required to have a red label. Nonflammable gases, such as compressed air, are shipped with a green label, indicating a safe material. Flammable solids, such as ammonium nitrate, are required to have a yellow label.

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The Arco Company, Cleveland 4, Ohio.

E. I. du Pont de Nemours & Company, Wilmington 98, Del.

The Glidden Company, 11000 Glidden Avenue, Cleveland, Ohio.

New Jersey Zinc Company, 160 Front Street, New York 7, N. Y.

L. Sonneborn & Sons, 88 Lexington Avenue, New York 16, N. Y.

American Standards Association
70 East 45th Street, New York 17

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Washington, D. C.

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ACKNOWLEDGEMENT

This data sheet was prepared by G. G. Grieve, Industrial Department, National Safety Council. It has been reviewed by the Safe Practices Conference Committee and approved by the Industrial Conference of the Council.

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Absolutely waterproof and windproof . . . Patterned roomy to be worn over regular clothing.

IPCO

The IPCO Utility Rain Suit consists of coat, pants and detachable hood. Double texture fabric with a sheet of solid rubber vulcanized in between assures waterproof qualities. Olive drab color.

Write for Bulletin K-21

IPCO *Safety Equipment for all Industries*

INDUSTRIAL PRODUCTS COMPANY

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RAMP-DOCKBOARDS

...are flexible for greater freight-loading efficiency

Ramp and Dockboard lock together with simple pin device
Hand holds in each corner for safe, easy handling
Special quarter round curbs prevent runoffs—offer maximum clearance for equipment
Beveled edges minimize jarring of load
Rounded curb ends allow greater turning radius

A combination of two sections—the ramp (with I-beam legs), and the Dockboard. Each lightweight magnesium unit can be handled safely and easily by one person. Dockboard is used as separate unit when height difference is less than fixed height of ramp. When greater height differences are encountered, the ramp and Dockboard combination is used.

Specially designed for applications where low-clearance loading equipment is used. Weighs only ¼ as much as steel ramps of equal size and strength. A modern answer to materials handling headaches in all industrial and commercial fields. Write for complete details today!

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Physician's Diary

(From page 29)

tails about his job, and the moment he found that I was earnestly interested in knowing everything about the hazards to health through his work, there was an eruption of his pent-up feelings.

"I Am Fed Up"

"Sir, I am just fed up with this place," he started in an excited mood. "They just care two hoots for us, thought they make big pretenses. They have put up a suggestion box. They had best break it and use it as firewood. It was two years ago — full two years ago," he went on still more excited, "when I had made a suggestion which can protect me against this very trouble. Not only that, but I took so much trouble and added to it a sketch of the box I want erected in this place.

"And Lord alone knows what they did with it, for I never heard a single word about it from them until six months ago when I had an opportunity to remind them about it. It was either lost or mislaid. They asked me to give them another copy. I did so, but up 'til today I do not know what they are doing with it."

This workman was a lad just in his twenties. He impressed me as full of enthusiasm and ambition, and the very first thought that came to my mind was that I should put him in the Safety First Committee when I start an accident prevention campaign. I asked for a copy of his suggestion. His eyes sparkled and he readily agreed. I offered to pick it up at my next visit. He, however, would brook no delay and suggested that I could have one just then, if I went with him to his foreman downstairs, who has a copy.

I feared it would be another disappointment to him if I refused. So we went. But the foreman was a cautious middle-aged man who thought he should not show it to me without permission from higher authorities. He was probably thinking, I felt, of prestige, discipline or red tape, and industrial medicine teaches that it is just

these things, and the wrong way they are enforced that are the bugbears which poison healthy management-labour relations.

It is probably that there was some exaggeration and even some untruth in the story this workman told me. It is still more probable that the management studied his suggestion thoroughly and rejected it because they found it impracticable. To do so, however, without taking the workman into their full confidence is the surest way of tempting him to feel thwarted through lack of recognition and lose all faith in management, and turn him completely hostile against them, and the more enthusiastic, ambitious and intelligent the workman, the greater his resentment against management.

Not Productive?

"Good morning, doc," an engineer accosted me, "I have to take measurements of your dispensary."

"What for?" I asked.

"Head Office wants to know the area occupied by productive and non-productive structures."

"And how do you classify the dispensary?"

"Oh! Of course, non-productive," he replied in a matter-of-fact way.

This was a highly jarring note to hear in the Year of Grace 1947, when industrial medicine all over the western world was fast coming into its own as an indispensable instrument of production of each and every industry, small or big.

I had a similar experience elsewhere. I had to discuss with a departmental head an accident with a view to its prevention in future. He flourished half-a-dozen papers in my face and said, "Here is the Head Office asking so many questions. Shall I answer them or go bothering about your safety fads?"

I scratched my head in amazement. Half-a-dozen queries in one day where I don't receive one in two years. But I remembered. I fall in the non-productive group. Such a division into productive and non-productive is an anachronism. Modern industrial psychology teaches that industry is not just a business but a social institution as well. The division of industrial work into productive and non-productive group is unnatural and mischievous. It is, however, a hopeful sign of the times that engineering schools of today are showing a growing tendency to integrate humanics, (i.e., the science of human relations) in the techniques of their machines.

An SOS

When I returned, an S.O.S. was lying on my desk. Workers of a department had become refractory and would have nothing to do with a safety guard I was trying out. I decided to face the crowd, but I was up against an angry one, for I had made the mistake of starting the experiment without first taking them into my confidence. They asked why I was troubling them unnecessarily with things that did not interest them, especially as I could not do anything for their urgent needs like drinking water, washing place, lunch room, and so on. I was only a blind old donkey, they said, if I thought I could do anything for them my way.

I felt uneasy and decided that the wisest course was a strategic retreat. In the crowd was Bala with whom I had long and happy doctor-patient relations. He followed me back to my office. The men did not at all mean harm to me, he tried to soothe me, but they were right when they said that I should change my methods before I could be really useful to them. I would never succeed with the authorities unless I created trouble for them and plenty of it. I wondered whether I should cry or laugh. I have tried crying and it does not answer. So I laughed and that did help a bit.

Management, however, thought otherwise, "What about discipline?" they asked, and that is the rub. A vicious circle grows larger and larger and poisons more and more management-labour relations when management fails to appreciate the social and psychological conditions upon which respect for authority depends and tries to tackle such a situation with disciplinary action. Neither a rod nor a carrot can help such a situation, what is needed is a heart to heart talk to remove misunderstandings, and one must learn to curb the human tendency "to measure one-

FASTER—SAFER—ELIMINATES SPLICING

Millions in daily use prove *Safe-Line* the right way to hold wire rope securely. It's the better way, too!

Better because *Safe-Lines* are faster than splicing and serving, or using U-bolts.

Better because *Safe-Lines* outpull the strongest rope, hold a tight thimble, minimize rope or sling breakage.

Better because *Safe-Lines* are easy to use and re-adjust, without special tools or skilled labor.

Better, too, because *Safe-Lines* enclose sharp wire ends, preventing personal injury and mental hazards.

Try this better way that saves you time and money.

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FORGED AND MASTER COINED TO FIT ROPE SIZES 1/16" TO 3/4"

Safe-Line double spiral splines fit each wire and strand, providing a powerful grip, without cutting action to the rope. Replacement guarantee on clamp against breakage and fracture.

WRITE FOR DESCRIPTIVE PRICE-LIST FOLDER

NATIONAL SAFE-LINE CLAMP CO.
11232 NINE MILE ROAD
VAN DYKE, MICHIGAN

self by one's feelings, and others by their actions."

"Does Not Deserve Pity!"

As I was about to leave for lunch, an accident came in. Three fingers of the right hand gone.

"What happened?" I asked the supervisor who accompanied him.

"Ask the stupid idiot how often I have warned him not to put his hand between the rolls. It is all his carelessness. He does not deserve any pity."

But you do, Mr. Supervisor, I said to myself, *as no one has taken the trouble to explain to you that there are moments in human nature and conduct when wrong things appear as right, and that is your business and mine to protect the workman against such evil moods.*

I went home late for lunch and sat to it without any zest. I was reviewing mentally the foreman's attitude towards the accident and wondered if these fellows will ever find out that life is never stationary. It must advance or fall back.

"What is worrying you, today?" asked my wife.

"We have had an accident."- - -

"Oh, well, that isn't much for a doc to worry about. Why, accidents occur everywhere."

"They do because we take so many things for granted. I am even told that an accident is more often than not an act of God."

"Are you trying to make out that any one can run a factory without having accidents?"

"I am. I can name dozens and dozens of factories which have had no accidents throughout a working year, because executives from top to bottom are actively interested in carrying out a well-organized and intensive campaign against accidents."

Just then the 'phone rang. Will the doctor please come over at once as the accident case was bleeding again?

"Do you see now what an accident means?" I turned upon my wife. "It means no fingers for the workman, no lunch for the doctor, no peace for the supervisor, who has to fill in half-a-dozen papers, more trouble for the management trying to find out to whom the baby belongs, no production till another is trained to do the job equally efficiently, confusion and commotion everywhere, and loss of morale all around, and all the while and all the way the financiers of the company have to keep paying over the accident with both their hands and through their nose as well."

I rose to get back to the factory. "But where will you take your tea?" she asked.

"Oh, we have a canteen at the factory," I said.

"Oh, don't tell me," she said with pouted lips, "that you are going to drink such stuff. If you want a little I will give you some in a thermos."

Not Good Enough?

But I indignantly retorted, "If that tea is no good for me, then the doctor in-charge there is no good for the factory." I picked up my hat and walked away, determined to save the remaining two fingers if I could, but on the way my brain kept repeating, if I could, but alas, I could not. One more gone to his doom while the Manager had not yet finished his search as to whom the baby belonged. It belongs to the top executive, and no one else, for accidents are bound to disgrace a factory unless he gives not only his moral and financial support but also his active ccoperation in the day to day work of a well-organized accident prevention campaign. "A safe future or no future" is the choice before him, so say experts in the line, including his colleagues, of U. S. A. and U. K. — chairmen of large corporations. Some other slogans they are circulating are:

Production and accidents vary in an inverse ratio.

Safety must come from the top down.

You must sell safety to the big boss if you are going to get anywhere.

Safety programme pays big dividends.

Management has everything to gain by talking, selling, and living safety.

For His Self-Respect

The post one morning brought in a complaint from Surenbabu, a junior clerk. One night he was in need of first-aid for an injury. While my assistant was still attending on him, a superior officer entered the surgery. My assistant promptly left Surenbabu half-way to attend on the officer, and Surenbabu had to wait for half-an-hour. It was my assistant's plea that this officer was known as unscrupulous and capable of creating trouble for small fry like him, and that was true. But Surenbabu had certainly a right to stand up for his self-respect.

I was in a mess. I said nothing to my assistant, but Surenbabu had to be appeased. So I wrote to him if he would kindly come over and talk it out with me. He came, a youngster still in his teens, barefooted, wearing a dhoti which hardly reached his knees and a thin cotton shirt. He saluted me courteously. Knowing the weakness of my case I showed him a chair. He would not sit down. I ordered him to sit. He did. I started talking, but hardly had I finished a sentence, when he stood up again, folded his hands and said, "Sir, I have no complaint now. The fact that you have sent me such a letter is enough satisfaction to me."

I was taken completely aback. Unconsciously I got up from my chair, shook hands with him and we parted good friends. This experience has often made me think furiously. It has been the turning point of my relations with the rank and file of operatives. It comes to my aid when I have to perform the irksome duty of settling their apparently meaningless quarrels.

* * *

A psychologist has rightly said that "A circular response in human relations is as much a law as any law of physics." Another has said that "Management is the development of people and not the direction of things."

1950 Transactions

The volumes of Transactions each year record the wealth of information and ideas presented at the National Safety Congress, the biggest annual event in safety. Safety leaders throughout the nation have for many years found the Transactions of the Congress a rich source for new ideas, methods, and devices which they can use in their own accident prevention programs.

Publication of the Transactions in small volumes — one for each section or division — permits wide distribution of pertinent material to supervisors, foremen, safety committeemen, branch plant managers, and nurses at small cost.

The complete set will consist of 34 volumes. Expected to be in stock this month are the volume entitled "Speaking with People," the record of the speeches given at the Early Morning Sessions, and the volumes covering the sessions of the following industrial sections: Aeronautical Industries, Air Transport, Construction, Food, Glass and Ceramics, Marine, Mining, Power Press and Forging, Printing and Publishing, and Public Employees.

Prices of individual volumes may be obtained from the Membership Department of the Council.

No-Accident Awards

Available to members only, the National Safety Council's No-Accident Award pins are widely used in industry as a means of providing recognition for safe workers. This screw-post pin features the Green Cross in green enamel and shows the number of accident-free years for which the award has been given. The 1 to 4 year pin is bronze; the 5 to 9 year pin, silver plate; the 10 to 40 year pin, gold plate.

To give these awards maximum significance, many companies plan special award ceremonies. Either departmental or all-plant meetings or special dinners are held, with executives making the presentations.

(This award may not be used as a driver award.)

New and Revised Cards

Additions to the Council's series of Safety Instruction Cards include six new cards for the Hospital Safety Service and three revisions of cards applicable throughout industry.

Prepared for distribution to hospital employees, the new cards are:

No. H 135—Crutch Tips

No. H 136—See Clearly When You Identify Medicine

No. H 137—Follow Directions When You Give Medicine

No. H 138—Pull the Plug — Not the Cord

No. H 139—Remember the Stool (when you get out of bed)

No. H 140—Flowers

Pertinent to the season, two of the revised cards are No. 107, *Ice and Snow — Control by Chemicals and Abrasives*, and No. 121, *Icicles — Removal*. The third revision is No. 326, *Asphalt Workers*.

Safety Instruction Cards, which are 3 by 5 inches in size, not only give the worker specific instructions in accepted methods of performing various operations, but also serve the supervisor or safety director as a rich source of practical information. The cards can be used in campaigns to correct unsafe practices, passed out for discussion at safety meetings, in some cases distributed as pay roll enclosures, posted beside machines or operations.

The supervisor can refer to the set of cards when he is preparing job analyses, writing safety talks or articles, and planning departmental or plant safety meetings.

The complete set includes a two-way index (Service Guide 5.2), a metal file case, and a set of numerical dividers. The entire set numbers approximately 690 cards, and the basic industrial set consists of 465 cards of interest to every industry.

The industrial set includes all the basic industrial cards plus those special industries cards which apply to the purchaser's own industry. The nonindustrial cards, covering motor transportation and off-the-job safety, are not included with the industrial set, but may be ordered separately.

Prices may be secured from the Council's Membership Department.

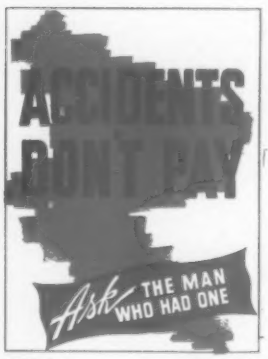
"Whip Your Weight in Wildcats" is an 8-page booklet on health, with emphasis on moderation and common sense. This booklet is one of a series of four; the others are "Happy Vacation," "Driver's Lucky Seven," and "Safety Round the Clock" (on home safety). All four are illustrated with cartoons and feature copy which is brief and easy to understand.

SAFETY POSTERS

IMPORTANT

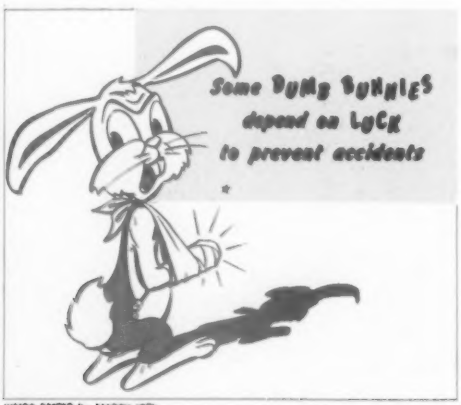
ALL miniatures shown on these pages are of NEW posters — produced for the first time this month. Excepting the Jumbo poster (below, left) all will be available during the remainder of 1951. Those displayed on the following pages in black and white are actually printed in two or more colors. We suggest you refer to this copy of the News in making monthly selections.

In addition to these new posters, you will find a great variety of subjects among the 744 posters illustrated in the 1951 Directory of Occupational Posters, and which will also be in stock throughout 1951. For a proven plan of selecting your posters objectively, refer to pages 4 and 5 in the Directory—a copy of which has been sent to all National Safety Council members. Additional copies are available at 50 cents each—write Membership Dept., N.S.C.



9220-C 25 x 38

Above new "C" poster, issued monthly, is indicative of the other two color posters —shown in black and white on the following pages and in the 1951 Poster Directory.



JUMBO POSTER for MARCH 1951

The Jumbo poster, issued monthly, is designed for outdoor use and is available to members on annual subscription but is not stocked. Its actual size is 9' 11" by 11' 8".

NATIONAL SAFETY COUNCIL

9210-A 8½ x 11½

This new four color poster is illustrative of the 72 four color posters shown in the 1951 Poster Directory.

Electrotypes of poster miniatures on this page are not available, nor can payroll inserts be supplied.

Posters below are printed in two or more colors
(Available only in sizes indicated)

NATIONAL SAFETY COUNCIL

8994-A **8½x11½**

NATIONAL SAFETY COUNCIL

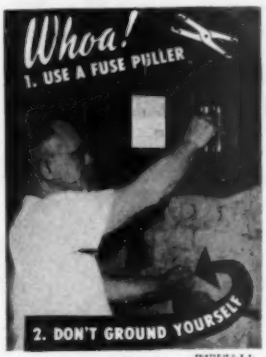
9143-B **17x23**

NATIONAL SAFETY COUNCIL

9184-A **8½x11½**

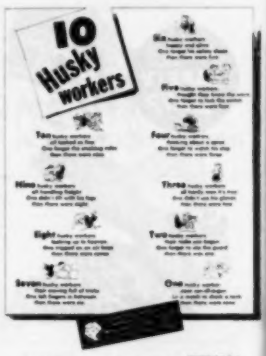
NATIONAL SAFETY COUNCIL

9119-B **17x23**



NATIONAL SAFETY COUNCIL

9181-A **8½x11½**



NATIONAL SAFETY COUNCIL

9159-B **17x23**

NATIONAL SAFETY COUNCIL

9218-A **8½x11½**

NATIONAL SAFETY COUNCIL

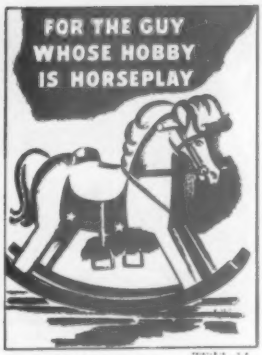
9145-A **8½x11½**

NATIONAL SAFETY COUNCIL

9182-A **8½x11½**

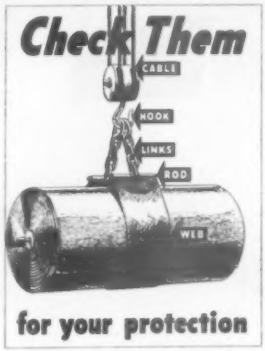
Electrotypes or payroll inserts can be furnished on all poster illustrations shown above.

Posters below are printed in two or more colors
(Available only in sizes indicated)



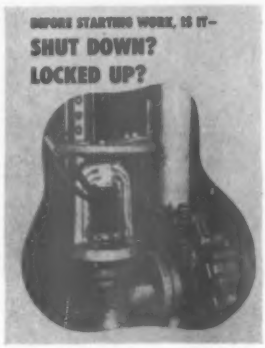
NATIONAL SAFETY COUNCIL

9198-A **8½x11½**



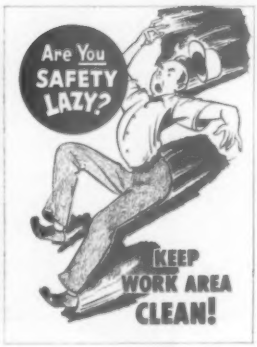
NATIONAL SAFETY COUNCIL

9213-A **8½x11½**



NATIONAL SAFETY COUNCIL

9185-A **8½x11½**

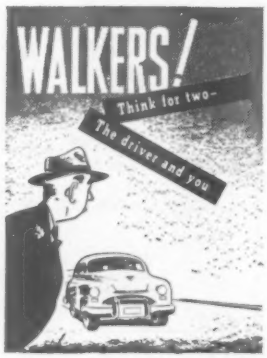


NATIONAL SAFETY COUNCIL

9187-A **8½x11½**

NATIONAL SAFETY COUNCIL

9207-A **8½x11½**



T-9195-B **17x23**

NATIONAL SAFETY COUNCIL

V-9205-A **8½x11½**

MAKE RIGHT TURNS
RIGHT!
AT THIS POINT you should have
1. Positioned your vehicle
2. Signaled your intentions
3. Checked rear-view mirrors
4. Slowed down gradually
FROM THIS POINT you must
1. Proceed with caution
2. Not bluff your way into traffic
3. Recheck your clearances of pedestrians and other vehicles

NATIONAL SAFETY COUNCIL

V-9200-A **8½x11½**

NATIONAL SAFETY COUNCIL

V-9206-A **8½x11½**

Electrotypes or payroll inserts can be furnished on all poster illustrations shown above.

Electricity and the Human Body

(From page 31)

ziel's results are summarized in Table I. A study of this table shows that the threshold sensation current is practically constant up to frequencies of 300 cycles per second. Above 100,000 cycles the sensation is one of heating rather than of tingling.

TABLE I
Threshold of Feeling

Frequency.	*Current in Milliamperes*	
Cycles	*Minimum*	*Mean*
Direct Current	2.	5.
A. C. 25		1.
60	0.4	1.
300		1.23
1,000		2.3
3,000		4.8
10,000		12.13
30,000		37.14
50,000		70.1
100,000		150.

While these sensation currents are not in themselves dangerous, they may be the indirect cause of more serious accidents. An individual who receives a small electric shock will involuntarily jerk away from the circuit. This sudden movement may result in a housewife upsetting a vessel of scalding water or a workman falling from a ladder. Therefore, the insulation of electric appliances should be sufficiently high to keep the leakage current below the threshold value.

Two fatal accidents recently brought to the writer's attention were the indirect results of low voltage shocks. These men were working in confined spaces and their jerking away from a small shock brought their bodies into contact with high-voltage circuits behind them.

Let-Go Current. It is a well known fact that when a current flows through the body, there is a contraction of the muscles. This contraction may be so severe as to make it impossible for the victim to release his grasp on the circuit. The let-go current is that value of current that an individual can withstand without harmful effects at least for the time required for him to release his hold on the circuit.

Professor Dalziel[7] has made an

QUALITY Protection Need Not Be Expensive!

Your company, especially, takes pride in the protection given your workers . . . but you asked StaSafe to produce a garment that would cost less and still possess StaSafe reliability.

Here's the result:

StaSafe BLACK NEOPRENE

A two-piece garment designed particularly for mucky, grime-filled areas. Features: Raglan sleeves, designed "roominess" for worker comfort, secure snap buttons, seams sewn in accordance with StaSafe quality standards and SEALED TIGHT, heavy-weight jacket flap, resistance to oils, grease, acids, caustics, solvents, paints, tars, creosote and naphtha. DOUBLE impregnated with StaSafe compound . . . Comes in Small, Medium and Large Sizes.

- **EXTRA protection!**
- **EXTRA comfort!**
- **EXTRA strength!**

Write NOW for more information!

STANDARD SAFETY EQUIPMENT COMPANY

232 W. ONTARIO **CHICAGO, ILLINOIS**

wear a

DUPOR No. 40

the Respirator that is U.S.B. of M. Approved for Type A Dusts

More than 40 sq. in. twin filter area. Sanitary face cloth. Soft rubber face mask. Controlled breathing . . . check valves guard against re-breathing stale air . . . exhalation valve exhausts breathed air. Greater visibility . . . no blind spots! Does not interfere with goggles or glasses.

Sample sent **$2.75 pp**

H. S. Cover Fog-Proof, Gas-Tight Goggles for use with above respirator . . . . $1.85 pp.

H. S. COVER, South Bend, Ind.

WHEELER
PROTECTIVE
APPAREL

Made from asbestos, flameproofed duck and jean cloth, fiberglas, leather and wool.

The best grade basic materials, painstakingly designed . . . for safety with comfort, and long wear, earned the WHEELER reputation of "MORE SAFETY PER DOLLAR."

APRONS
ARM PROTECTORS
ASBESTOS FIREMEN
BLANKETS
CAPES
CAPS
COATS
CURTAINS
GLOVES
HAND PADS
HELMETS
HIP LEGGINGS
JUMPERS
LEGGINGS
MITTENS
OVERSHOES
PANTS
SLEEVES
SPATS

WRITE TODAY!
FOR OUR BEAUTIFUL NEW CATALOG G98

WHEELER PROTECTIVE APPAREL, INC.
226 W. Huron St., Chicago 10, Ill.

PROTECTIVE WHEELER APPAREL

exhaustive study on a representative group of men and women and reports that for men the commercial frequency let-go current is nine milliamperes and for women, six. These are the current values that 99.5 per cent of the individuals tested could release voluntarily. The value varies with the individual. For men it ranges from 8 to 22 milliamperes.

Freezing Current. The freezing current is that value of current which will produce sufficient contraction of the muscles to hold its victim fast to the circuit. The freezing current is naturally greater than an individual's let-go current. It is dangerous because it requires only a few seconds for blisters to form on the skin where the current passes through the high-resistance epidermis. The epidermis then loses its protective resistance and the current increases in accordance with Ohm's law. Unless there is someone present to break the circuit and release the individual, the result may be fatal.

Current Producing Unconsciousness. The maximum current that an individual can tolerate for a short period without losing consciousness lies somewhere between the freezing current and the current that will produce ventricular fibrillation of the heart. Its value lies between a freezing current of 15 to 25 milliamperes and the fibrillating current of 75 to 100 milliamperes.

Fibrillation Current. The fibrillation current is of the order of 100 milliamperes or 0.1 amperes. This current when flowing from the hands to the feet is not sufficient to hold the heart in diastole; instead it disturbs the rhythm and the coordination of that organ.

This condition is called ventricular fibrillation. Each individual bundle of heart fibres acts by itself without coordination with the others. The action of an exposed heart in fibrillation reminds one of the ripples that flow across a puddle of water when a pebble is dropped into it.

Ventricular fibrillation has been induced in the exposed hearts of laboratory animals by currents ranging from 8/1000 of an ampere to half an ampere or slightly more. When the ventricles of the heart are in fibrillation, the circulation of the blood ceases and death will shortly ensue.

Nerve-Block Current. The current that will produce a block in the nervous system is from one to several amperes in amount. The block in the nervous system may be either in the cord connecting the fourth ventricle of the brain to the lungs or in the fourth ventricle itself. This block will prevent the lungs receiving a signal from the brain and normal respiration will cease. Artificial respiration should be started promptly in these cases.

If the heart is not thrown into ventricular fibrillation by the shock, there is an excellent chance that nature will repair the block and that after a period of artificial respiration normal breathing will again assert itself.

It must be kept in mind that both nerve block and ventricular fibrillation may result from the same electric shock. In such cases all that can be done in the field is to apply artificial respiration. This should be continued until either the victim is resuscitated or rigor mortis sets in. Wills Maclachlan[8] reports a case of successful resuscitation in which artificial respiration was continued for eight hours.

Countershock Current. The countershock current is that value of current which will bring the ventricles of the fibrillating heart to rest. About 1.5 amperes passing directly through the heart will stop ventricular fibrillation. This was first reported by Prevost and Batelli[9] in 1899. Kouwenhoven and Hooker[10] were successful in recovering the expired fibrillating hearts of dogs by countershock.

Ferris, King, and Spences, and Williams[11] recovered the hearts of sheep by sending a current of some 20 amperes at 2,000 volts through the chest of the intact animal.

In 1947 Beck[12] reported the successful stopping of ventricular fibrillation in a young man. Beck opened the chest and applied the electrodes directly to the heart using a current of 1.5 amperes.

Surgeons as well as safety engineers have a vital interest in ventricular fibrillation which is a form of cardiac arrest. It has occurred in almost every conceivable surgi-

cal operation on all parts of the body. For the most part the catastrophe occurs in people with normal cardio-vascular systems.

It has been reported as having occurred during the course of every type of general anesthesia and is especially likely to occur in operations on the heart. Many hospitals are now equipped with apparatus for applying a resuscitating shock direct to the heart should fibrillation occur.

Excessive Currents. When contact is made with high-voltage circuits very large values of current may flow. Such accidents usually result in severe burns. The burns are not necessarily limited to the points where contact was made with the circuit but have been reported at locations[13] such as the elbow where most of the area is bone, which is a relatively poor conductor compared to the body tissues.

Effects

The passage of an electric current through the body produces numerous effects[14] that differ not only in intensity but also in kind. They range all the way from a tingling sensation to death. The sequel depends upon the value, the frequency, and the pathway of the current, and on the duration of the shock.

The effects may be good or evil, healing or fatal. In certain mental diseases an electric shock may prove healing. On the other hand, a shock may produce either a state of depression characterized by a rapid weak pulse, shallow breathing, pallor, restlessness, and a depressed mental state similar to surgical shock or a highly excited, almost maniacal state.

Conscious Phenomena. If the victim of an electric shock retains consciousness during and following an electric shock, there is often a ringing or whistling in the ears, and there may be partial deafness for a time.

In addition, some visual disorders such as flashes and brilliant kaleidoscopic spots of colors appear. Pain and soreness in the muscles are common. The victim often will be restless and irritable. These symptoms will usually disappear after a few hours.

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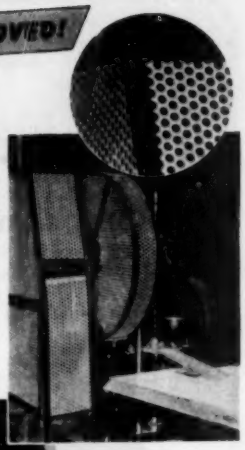

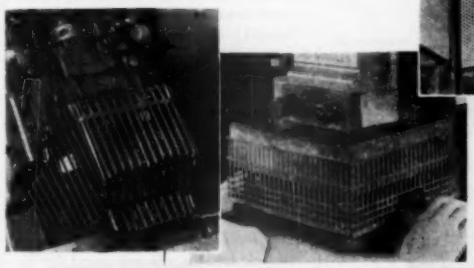

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contraction of the muscles takes place when contact is made with an electric circuit. This contraction is much more severe on commercial frequency circuits than on direct-current circuits. Where exceptionally good contact is made or where high voltage is involved, the tetanus of the muscles may be very sudden and severe. It may throw the victim clear of the circuit and cases of broken bones have been reported.

It is believed the severeness of this contraction accounts for the soreness of the muscles that may result. Clonic contractions are often observed and tremors may continue for some minutes following an electric shock.

Convulsions. Convulsions may take place following an electrical contact. They are usually characterized by irregular muscular spasm and tremors.

Electric Shock Therapy. Electric shock treatments are used by psychiatrists in the treatment of psychosis. It is most effective in the treatment of depressions.

The treatments usually result in a marked impairment of memory, but memory usually returns completely a few weeks after the treatments stop. Marked changes are found in the electroencephalograms which record the electric brain waves.

There is no universally accepted theory which explains the cures that have resulted from electric shock therapy. Although this treatment is used extensively, only a few deaths have occurred following the shocks and cases of permanent injury are rare.

Narcosis. When an electric current passing through the brain of a patient produces convulsions, there follows an unconscious period lasting several minutes. This period of unconsciousness might be considered an electric anesthesia as the patient is insensitive to pain. Some doctors[16] have attempted to produce periods of narcosis by using lower values of current and thereby eliminating the convulsion.

Luduc of Leipzig claimed in 1902 that he had produced electric anesthesia by passing interrupted direct currents through the patient's head. Other investigators including the author have repeated Luduc's experiments without success. Hertz [17] in his thorough study of the subject found that anesthesia was not attained in either animals or men.

A so-called electric anesthesia is used by the British in slaughter houses. One electrode is placed in the mouth and the other on top of the head and a 50 cycle current is passed through the brain. The shock renders the animal unconscious. Bleeding is reported to be more complete following this treatment than in normal slaughtering practice because of the rise in blood pressure that follows the shock.

Electric Burns. Burns are sometimes the results of an electric shock. They are of two types: heat burns, resulting from the electric arc that may be formed at the contact, and electric burns. The true electric burn is often characterized by a pinkish or reddish spot or area on the surface of the skin. Such burns, however, may penetrate deeply and require considerable time to heal.

Burns, blisters, and marking are not necessarily present on the skin after an electrical accident. When the skin is saturated with water and the contact area is large, a fatal shock may not leave the slightest detectable blemish. Burns produced by electricity usually heal slowly and without infection. In severe cases limbs or fingers may be lost and death may follow as a secondary effect.

Loss of Consciousness. A victim of electric shock may lose consciousness. In some instances he may recover spontaneously and in others only after the application of artificial respiration. Instances have been reported where unconsciousness resulted from a contact with a circuit at two points on the same leg or arm in which there was no burning of the tissues. In such cases no current passes through any of the vital organs and the cause is believed to be severe shock to the system.

Emission. Ejaculation of seminal fluid is common in males and occurs at low as well as high voltages. The severe muscular contraction is believed to be responsible for the phenomenon.

Incontinence. The victims of electric shock are in some cases incontinent for a time and in some

instances blood is present in the urine.

Rise in Blood Pressure. An electric shock that does not cause cardiac arrest is usually followed by a rise in blood pressure due to a rapid heart rate. The pressure usually remains high for a period and gradually returns to normal.

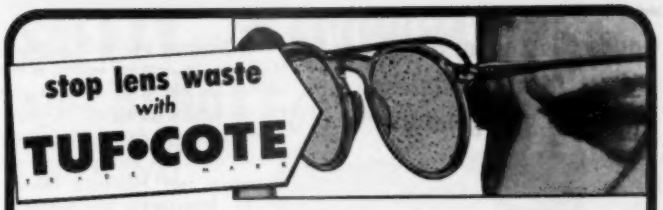
Hemorrhages. Petechial hemorrhages are sometimes found in the brain, the spinal cord and other organs. The eyes may be bloodshot following a shock due to the rupturing of blood vessels in the conjunctiva. Gross hemorrhages have been reported in the fourth ventricle of the brain upon autopsy.

The Nervous System. Contact with an electric circuit may so profoundly shock or fatigue the nervous system[18] that it cannot function normally for a period of minutes or hours. The nerve cells may be injured particularly in regions that have been traversed by the current. The injured cells are characterized by a dark shrunken nucleus which is often eccentric in position and by the loss of granules.

The damage, however, is patchy in distribution and injured and normal healthy cells lie in close proximity. Autopsy of some shock victims have revealed cavities in the nervous system of 25 to 200 microns in diameter. These may have been caused by heat or by electrolysis.

One of the most common effects is the production of temporary paralysis or block in the nervous system. The location of this block is determined by the pathway of the current. The lungs may be paralyzed by the shock as already discussed. Other portions of the body may also be temporarily paralyzed following a shock.

There is a case on record where a woman stood with her back resting against an electric range when the power wire was struck by lightning. She received a severe shock which was followed by a temporary paralysis and loss of sensation in both limbs which lasted for approximately four hours. The many successful applications of artificial respiration to electric shock cases may be ascribed to the temporary nature of this paralysis.



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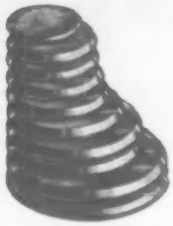

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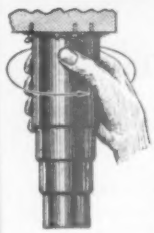

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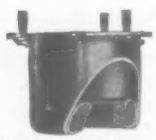

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The damage produced by electricity in the nervous system is not specific in that other diseases give rise to similar patterns.

Permanent Effects. Permanent lesions of nerves and paralysis are extremely rare following electric shocks but there are authentic examples. These are usually characterized by muscular atrophy in the limb through which the current passed. Usually, there was pain and weakness following the accident, which gradually developed into a slow atrophy.

In assessing the value of reports of permanent injuries, one should use considerable critical judgment. These cases are extremely hard to evaluate because of the great desire for compensation. It is clear from the records that most victims either die immediately or recover, perhaps after extensive burns have healed, without demonstrable neurological damage.

Death. Death from electric shock may result from a number of causes or from a combination of two or more of them. In general, low voltages and small current shocks kill through the mechanism of ventricular fibrillation, and high voltages either through the destruction or inhibition of the nerve centers, asphyxia being the most common immediate cause of death.

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Advanced in Safety

(From page 22)

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The firemen who participated in the demonstration were so trained

that they moved like precision machines for every whistle from the fire chief. The technique of aircraft crash fire rescue was also demonstrated, and the effectiveness of asbestos suits in resisting heat was also demonstrated by firemen in the suits walking into a gasoline fire.

6. Electrical Installation

All electrical installations are inspected periodically and are maintained in perfect condition by licensed electricians. This will reduce fire hazards caused by electricity to a minimum. All electrical installations in restricted areas (carburetion room, paint and dope shop, etc.) are vapor-proof.

7. Smoking

To maintain these serious fire hazards the area was analyzed and conspicuous "no smoking" signs have been posted at these restricted areas. The no smoking rule is strictly enforced and observed from the highest official of the company to the lowest cleaner. Places where smoking does not constitute a fire hazard are also properly posted with signs allowing smoking at those areas. This is to discourage clandestine smoking by providing places where employees can smoke.

8. Fire Alarm System

An air raid siren located on top of one of the hangars is being used as a fire alarm. An arrangement has been made with National Airport Corporation Fire Department so that an alarm at our location will notify them.

9. Plant Housekeeping

From the fire prevention standpoint cleanliness and orderliness in all shops, hangars, buildings, and premises is being maintained by a crew of yard cleaners and all personnel in general. In this connection regular trash containers with self-closing covers are located within the area. Trash is collected every day.

Other safety activities, such as plant housekeeping, safety contests and periodic meetings, are enthusiastically organized and implemented. The continued success of this safety program will be due largely to the perfection of safety techniques and to the vital factor of cooperation.

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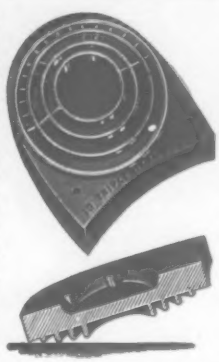

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(From page 42)

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When a new contract is awarded, the district safety engineer and project engineer discuss with the new contractor a proposed safety program. Here government safety plans are coordinated with those of the contractor, and safety is made an integral part of the contract.

Calendar Contest Winners for December

First prize in the National Safety Council's Safety Calendar Contest goes this month to Joe Johnson of Independence, Missouri. Mr. Johnson is a loader for the Standard Oil Company (Indiana) at Sugar Creek, Mo. The theme in this contest was careless handling of guns. Mr. Johnson's two-line rhyme was adjudged best of all those submitted. It was:

When you're through hunting,
unload your gun
So this won't happen to anyone.

Second prize went to Glen Ridgway, Shelbina, Mo. for this rhyme:

We need mobilization . . .
there is no doubt,
But each reckless gun-toter
we're better WITHOUT!

Third prize was awarded to Mrs. Blanche H. Webb of Anderson, S. C., for the following rhyme:

The danger isn't in a gun;
It's in the GUY who handles one.

Thirty $5.00 awards were issued to:

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William A. Arnold, Oak Ridge, Tenn.
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Mrs. Elwyn E. Breaux, Guthrie, Okla.
Mrs. Paul C. Crary, Spokane, Wash.
Mrs. Helen M. Smith, Utica, N. Y.
Mrs. P. W. Bass, Parksville, B. C., Canada
Thomas McDonough, St. John's Orphanage, Rockaway Park, N. Y.
Thomas H. Mistler, postal clerk, Covington, Ky.
Mrs. Adeline Reinhart, Palo Alto, Cal.
Harman Trussell, pipefitter, Hercules Powder Co., Hattiesburg, Miss.
William J. Burke, electrician, Bethlehem Steel Corp., Seattle, Wash.
Thelma Faye Bement, payroll clerk, Santa Fe Trail Trans. Co., Wichita 12, Kan.
H. C. Ervin, asst. branch manager, Fiberglas Corp., Cincinnati 36, Ohio
C. Earle Trucksess, draftsman, Belmont Iron Works, Philadelphia, Pa.
Dorothea Dunlea, Pasadena, Cal.
Jess E. Strader, Aberdeen, S. D.
K. M. Witt, Manheim, W. Va.
Warrick E. Lee, manager, Bell Telephone Co., Carbondale, Pa.
V. W. Willmore, Ocean Falls, B. C., Canada
W. Vowell, Hammond, Ind.

Make Blasting Caps Five Years Without Injury

Few people would expect a blasting cap plant to be one of the safest places to work, yet over 650 men and women of the Atlas Powder Company's blasting supplies plant near Tamaqua, Pa., during the past five years have made more than 250,000,000 blasting caps without a disabling injury.

The last disabling injury at the plant occurred December 5, 1945, when a worker strained his back handling a drum of materials. Since that time the employees have worked some 6,865,000 man-hours.

The manufacture of blasting caps involves stamping copper sheets into small cartridges, preparing and mixing the flash and explosives ingredients, then loading the cartridges.

NEW SAFETY EQUIPMENT FOR INDUSTRY

Manufacturers are invited to send in announcements of new products, or improved special features. Only items which can be considered as "news" to our readers will be published.

Respirator

The new No. 2099 air line respirator is announced by American Optical Co., Southbridge, Mass. Recommended for such operations as paint spraying, welding, cleaning tank cars, abrasive blasting, and similar work, the new air-supplied respirator is especially useful where contaminants are unusually heavy. It protects against dusts, fumes, vapors, mists, smokes and gases. No filters or cartridges are needed because a continuous flow of fresh air is directed through the hose.

Features include the use of R2000 respirator facepiece, a 2½ foot flexible, nonkinking, rubber breathing tube plus a 12½ to 50 foot length of ¼ inch diameter air hose. Hose is resistant to oil, grease or gasoline penetration.

Air flow to the facepiece of the respirator is regulated by an adjustable valve clipped to the worker's belt or clothing. Valve locks in position and cannot be accidentally changed. A detachable hose coupling at the junction of breathing tube and supply hose automatically shuts off air supply when detached. The entire assembly is designed to operate at air line pressure between 9 and 25 pounds psi.

Safety Goggles

Two new completely revised and improved series of safety goggles—the 7000 and 3081 series—are announced by American Optical Co., Southbridge, Mass. The 7000 series metal safety goggles provide maximum eye protection with rugged construction, rigid saddle bridge and reinforcing bar for extra strength. Temples now have brown tubing which cannot discolor and will outlast the temple. Temple and endpiece screws are new Evertite construction with countersunk, non-snagging heads. Wide bearing surfaces minimize temple drop.

Eyewires are now flat instead of round and have attractive beading. Eyewire bar is also engraved and the flange that holds the side shields, which are optional, has been reduced and given rolled edges. An important new feature allows the lenses

to be replaced without removing side shields.

The 3081 series has the same sturdy construction as the 7000 and has been improved with the same new design features. The bridge and reinforcing bar are covered with a soft leather guard to protect the wearer against heat or cold, foreign bodies and stray light. Side shields of soft leather provide comfortable protection against heat and cold, flying particles and light. The side shields are permanently attached to the rolled edge, binder type, one-piece eyewire. This allows lenses to be replaced without removing side shields. Both goggles can be obtained with clear or Calobar, regular or 6 curve Super Armorplate lenses.

Self-Adhering Bandage

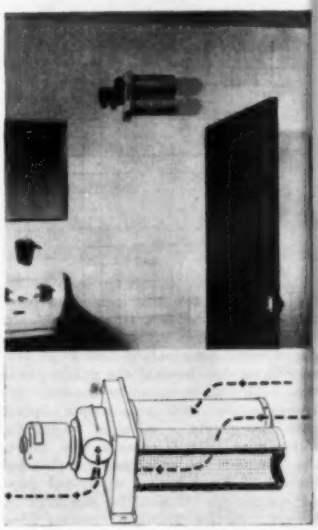
A first-aid bandage-compress than can be put on with one hand by the injured person himself, is announced by Davis Emergency Equipment Co., 45 Halleck St., Newark, N. J. The new bandage is known as the Davis self-adhering compress bandage. The 60 inches of bandage are impregnated with an adherent substance which makes each layer of bandage adhere firmly to the one below, but which does not adhere to the skin.

A 2" x 2" cotton-lined gauze compress is fastened to the bandage, and can be unfolded to 2" x 4" if desired. The bandage can easily be put in place by pinching together the first loop of bandage and then winding the balance on. The end of the bandage remains securely in place without tying, pinning, or using adhesive tape.

Another use stressed is that of pressure bandage for burns. It can be applied tightly and, because of its adhesive qualities, retains the tension without slipping or unwinding. The bandage is packaged for the D-carton First Aid System, also originated by Davis.

Lavatory "Air Improver"

W. B. Connor Engineering Corp., Shelter Rock Lane, Danbury, Conn., has developed a small carbon air purifier for lavatory and toilet areas. Called the "Air Improver," the unit is essentially an indoor ventilating device which might be called a "fresh air generator." Continuously drawing the room air through activated carbon to remove odors and discharging a steady stream of filtered air, it adds to the normal ventilation air supply.



The device does not change the air in any way except to filter out impurities. Design is simple, consisting of two metal canisters containing 3 pounds of activated carbon, and a quiet 3,000 rpm motor-blower which circulates the air at the rate of 60 cubic feet per minute. In a room measuring 1,000 cubic feet this would mean that all the air in the space is purified 3½ times an hour. Over-all length is 18 inches and it may be fastened at any convenient spot. It uses approximately as much electricity as a small light bulb.

NEW SAFETY EQUIPMENT FOR INDUSTRY

Further information on these new products and equipment may be obtained by writing direct to the manufacturer. It will help in identifying the product to mention this announcement.

Wheeled Extinguisher

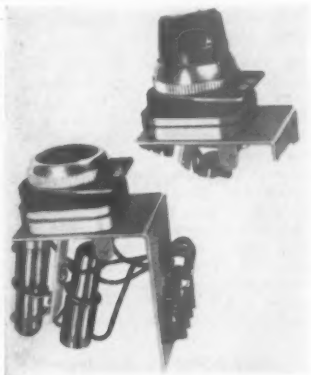
Walter Kidde & Co., Inc., Belleville, N.J., announces a wheeled dry chemical fire extinguisher with 150-pound powder capacity for combating flammable liquid (Class B) and electrical (Class C) fires in industrial plants, textile mills, airports, garages, refineries and utility power properties. The new extinguisher, recommended for use against fires too severe or extensive for extinguishment with 20-pound or 30-pound portable dry chemical units, has several features that make it dependable and easy to handle.

Mounted on two wheels, and properly balanced to permit one man mobility, are two large upright steel cylinders. The larger cylinder contains 150 pounds of fire-smothering dry chemical, the smaller cylinder holds nitrogen under pressure of approximately 2000 pounds per square inch. To operate, a valve on top of the nitrogen cylinder is opened. This admits the nitrogen to the powder chamber through a normally-open valve, and pressurizes the dry chemical for discharge. A pre-set regulator maintains constant pressure within the dry chemical cylinder discharge, and a safety valve prevents damage to the powder cylinder if the pressure should exceed that for which the regulator is set.

On the end of a 50-foot heavy duty hose, easily removed from a carrying bracket on the side of the powder cylinder, is a discharge nozzle with stirrup-type control lever. The lever has three positions: "Off," "fan," and "straight" for control of the powder stream. In fighting extremely hot fires, such as the flammable liquid spill fire, the "straight" discharge pattern is used first. This gives a long-range, concentrated stream that knocks the fire down quickly and subdues the heat sufficiently to permit the fire-fighter to move in close to the blaze. Moving the control lever to the "fan" position discharges a dense blanket of dry chemical over a wider area, at comparatively slow velocity, for maximum coverage and fire-killing power. All materials used in the new extinguisher are corrosion-resistant and the dry chemical mixture is formulated to prevent moisture absorption and clogging.

Safety Switch

For safety in explosive locations, Panalarm Products, Inc., 7212 N. Clark St., Chicago 26, has developed a mercury switch with either push button or selector knob. The unit consists of a hermetically sealed mercury switch mounted on a lever-operated armature. To operate the switch the selector knob is turned or the button pushed which inclines the armature thus actuating the mercury switch. There is no possibility of a spark because the actuating linkage is purely mechanical in nature.



The switch is designed for vertical panel mounting and is a single pole switch with either double or single throw action. Push button models feature a spring action that returns the switch to original position when finger pressure is released. The selector switch type can, of course, be set in either "on" or "off" position.

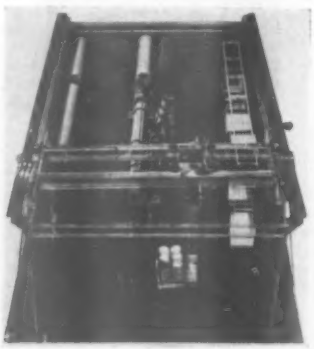
Cover Lenses

New plastic cover lenses said to have unusual long life are announced by American Industrial Safety Equipment Co., 3300 Lakeside Ave., Cleveland, Ohio. The new cover lenses known as "Duralite" offer certain advantages. Among these are freedom from pitting, because sparks are repelled by the material, resistance to heat up to 300° F., freedom from warping or softening at high temperatures, freedom from discoloration, and resistance to scratching.

Duralite cover lenses are made in sizes to fit all helmets and goggles.

Storage System

An entirely new method of storing materials provides 100 per cent selectivity in handling any item of any size or shape, and is adaptable to such diversified objects as rough stock, pallets, rolled goods, drums, bundles, dies, patterns, tote boxes and practically any item. It has one-man push-button control, and with this one attendant it delivers incoming materials to the position specified, or quickly and accurately selects required units or materials from storage and makes prompt delivery at the required point. All storage space is utilized more than in most systems.



Essentially this new Stak-Rak system consists of self-standing rack-columns designed to receive the required material and arranged on either side of narrow aisles. A crane bridge spans the entire width of the storage area and travels lengthwise on tracks to any depth. It is equipped with an overhead trolley from which is suspended an electric fork lift. The fork lift revolves to serve either side of the aisles and with a push button in his hand a single operator can control any or all motions required to place or remove any item from its place on the rack in any aisle.

The method is simple, practical and exceedingly flexible. It may consist of continuous shelving or any type of rack, although it may also be adapted to the handling of skid boxes or other self-stacking fixtures. Aisle requirements for loads up to 2000 lbs. capacity are the actual physical dimensions of the unit to be handled plus 8 inches for the column and the

NEW SAFETY EQUIPMENT FOR INDUSTRY

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necessary running clearance. The fork lift may be supplied with 36" forks with a horizontal spread of 3 ft., or a multiple fork for handling long materials, such as bar stock, with a 10 ft. spread. Because of the narrow aisles and the fact that materials can be stored to the greatest usable height, this system just about doubles the available storage space by doubling the cube. Complete engineering and design facilities are provided by the manufacturer, Chicago Tramrail Corp., 4000 W. Washington Blvd., Chicago 24.

Wax Floor Dressing

Cetox, an all-weather slip-resisting floor wax, is announced by Chemical Service of Baltimore, Howard and West Sts., Baltimore 30, Md. The new floor dressing is consistent in color, viscosity and performance and is especially serviceable under tracked-in water, rain snow or sleet.

Buffability and ash soilage tests show Cetox has great aversion to dirt. It dries readily and 24 hours after applying it develops water resistance. It will withstand repeated water washings without loss of coating or brilliance.

The hydraoxation of carnauba wax and Cetox formulation is an exclusive development of Chemical Service of Baltimore, manufacturers of waxes, soaps, cleaners, disinfectants and chemical specialties. The product has been tested and listed by Underwriters' Laboratories.

Safety Tongs

Safety tongs of new design and construction have recently been introduced by Magline, Inc., Pinconning, Mich. Cast from a special magnesium alloy, the tongs are designed to crush, if caught within the die opening, without inflicting any damage to the die itself. The tongs are the result of many requests for a unit which would com-

bine lightness, strength and rigidity. They permit easy one-hand operation and clear the way for higher production speeds, while actually reducing operator fatigue. The medium duty tongs weigh only six ounces. Standard and special models are currently being manufactured.

Pressurized Extinguisher

The first pressurized extinguisher designed for hazardous metal fires has been developed by Ansul Chemical Co., Marinette, Wis. This MET-L-X dry powder extinguisher is effective on fires in magnesium, sodium, potassium, zinc, powdered aluminum, etc. The extinguishing agent fuses and forms an air-excluding crust over the burning metal. Without oxygen, the fire goes out.

Small particle size of the dry powder makes possible its use in a gas-pressure type extinguisher. The new extinguishing agent is moisture-repellent, free-flowing, non-toxic, non-corrosive and non-abrasive. It does not conduct electricity and will not deteriorate under normal conditions.

Advantages of a pressurized extinguisher for metal fires are that the stream may be directed by the operator, which provides uniform coverage of the burning area and insures most efficient use of the extinguishing agent. Metal fires may be fought at safe distance, minimizing danger of burns. Extinguishing agent can not be contaminated by water or other foreign substances, since it is sealed in a container.

Ansul MET-L-X extinguishers are manufactured in 30 lb., 150 lb. and 300 lb. sizes. Larger units, including an automatic piped system, are also available.

Cut-Out Coupling

A new automatic device for machine tools, processing equipment, conveyors, etc., instantly shuts off the power when an overload due to any cause occurs and resets itself automatically, preventing sheared pins and saves the time normally required to replace them.

The new cut-out coupling is manufactured by Anchor Steel & Conveyor Co., 6906 Kingsley Ave., Dearborn, Mich. It combines the features of a flexible coupling with the torque-sensitive protection of the already widely used Anchor cut-out pulley. The couplings are furnished in two sizes and with working ranges from 10 to 2,000 inch pounds torque.

Foam Nozzle

National Foam System, Inc., West Chester, Pa., has developed a foam nozzle which can be changed instantly and easily from a closely-knit foam spray to a long-range foam stream known as the Aer-O-Foam spray-stream nozzle.

Through an easy-to-operate bolt action, the operator has at his finger tips the means of combating a serious spill fire or a distant hazard. Should heat become too intense for the operator when using the straight stream, he can switch at once to the protective curtain of the spray. This new nozzle is of the same basic design as the regular National "RP" type nozzle. The built-in spray feature does not interfere with the range found on the "RP" nozzle.

NEW SAFETY EQUIPMENT FOR INDUSTRY

Further information on these new products and equipment may be obtained by writing direct to the manufacturer. It will help in identifying the product to mention this announcement.

The spray-stream nozzle is light in weight, and eliminates the necessity of carrying spray attachments. The nozzle can be used with either pre-mix or pick-up tube.

Radiation Detector

A new atomic radiation detector to permit direct radiation readings at a glance has been announced by General Electric's Special Products Division, Schenectady, N. Y. Called a "radiation monitor", the new instrument weighs less than a pound and is about the size of a quart oil can. It is equipped with a self-contained power source and has neither tubes nor batteries.

According to the engineers who developed the device, radiation measurements are read from the monitor simply by noting the position of a pointer as it moves across a graded scale. The speed at which the pointer moves across the scale is in proportion to the strength of radiation, and the distance it moves in a given time indicates the amount of radiation to which the instrument has been exposed during that time.

The monitor is for use by engineers, scientists, doctors, and technicians who are working with or near sources of radiation, and can warn of the presence of radiation in amounts much less than those permitted by even the most stringent safety regulations, according to the engineers. This sensitivity, coupled with a continuously-visible indication, will give warning of a radiation hazard in an area while there is still time to avoid excessive exposure. This differs from the type of monitor that is read only at intervals, when it may already be too late to prevent an overdosage.

Portable Vacuum Machine

A new portable heavy duty vacuum machine, developed by the Hild Floor Machine Co., 740 W. Washington Blvd., Chicago, is now available through all Hild distributors. Designed for both wet and dry pick-up, the new machine is always ready for work, ready to pick up either liquid or dry dirt without adjustment or change of parts. This safety feature is the result of a specially developed, new type of power unit. The machine employs a "by-pass" motor which does not depend on the vacuum air stream for cooling. The air stream from the vacuum does not pass through the motor housing. This the motor cannot be damaged by dust or moisture picked up by the vacuum. A separate independent cooling fan keeps the motor running cool, even when the vacuum intake is "sealed" against the floor carpet.

Other design improvements are the ball-bearing swivel casters equipped with string-guards which always keep the machine rolling freely. Non-rusting swivel type hose connections for both vacuuming and blowing are permanently built-in. A rack is provided for conveniently carrying or storing the hose when not in use. Newly designed attachments equip the machine for scores of clean-up jobs on floors of all kinds, on rugs or carpets and "overhead" —cleaning pipes, ceilings, walls, venetian blinds, machinery, etc.

Fire Extinguisher

American-LaFrance-Foamite Corp., Elmira, N. Y., announces it has designed and placed on the market a completely new 1 quart air pressure fire etxinguisher. It discharges vaporizing liquid fluid for extinguishing both flammable liquid and electrical type fires.

It aims and operates like a gun with trigger-quick action. It hits the fire target accurately with no unnecessary loss of liquid. It requires no pumping. Simply aim and squeeze the trigger. Anyone can operate it, and with one hand.

It is easily recharged by simply pouring in more vaporizing liquid and can be pressurized with any standard air chuck as commonly used in gasoline service stations, or it can be pressurized with any ordinary tire pump. It is recommended for protecting autos, motors, trucks, trailers, airplanes, street and railroad cars, and electrical equipment. It will prevent many small oil and grease fires from becoming big blazes.

The new extinguisher is called the Alfco Pressurized Fire-Gun and carries the inspection and approval label of Underwriters' Laboratories.

NEWS ITEMS

W. E. Noyes, General Sales Manager of The Diversey Corp., 1820 Roscoe St., Chicago, Ill., for the last four years, has been named vice-president in charge of sales.

Mr. Noyes joined Diversey in 1935 with a broad background in sales, management and technical service in the dairy industry. He had been a staff member of the Lansing, Michigan, Health Department for six years in charge of milk, food and meat inspection. With Diversey, Mr. Noyes began as a field service representative in the Farm Quality Control Department. Later he was named manager of The Cleveland Division, a position he held until 1943 when he was appointed promotional manager of the Dairy Department. He was made assistant general manager early in 1946 and promoted to general sales manager in the fall of that year.

* * *

A new fleet plan of "service to customers" was recently inaugurated by the Hillyard Chemical Co., St. Joseph, Mo., for the states of Colorado, Iowa, Illinois, Ohio and New Jersey. Plans are already under way to repeat this program in other states. Its streamlined design is particularly adapted to the needs of bringing "on spot" floor maintenance help to Hillyard customers, throughout the country.

The fleet is composed of ½ ton paneled Chevrolet trucks, known also as Sedan Deliveries. The neat clean lines of the model chosen, give it the appearance value of a smart town car, yet, through master designing a usable loading space of 150 cubic feet is allowed.

In conjunction with Hillyard's merchandising plans, the color of the new trucks is white over-all, with a distinctive blue checkerboard trim. Each Hillyard truck constitutes a complete floor clinic. In a compact, convenient, easily accessible space, this truck carries needed samples and supplies of floor treatment products direct to the user. It carries a Hillyard Maintaineer in attendance who is trained in all phases of modern floor care. The Maintaineer, with full equipment can drive up to a customer's doorstep, take a look at problem floors, listen to troubles about "wear-out," "traffic-dirt" and "slipping hazards." Then graphically show customers how to remedy the trouble with Hillyard products.

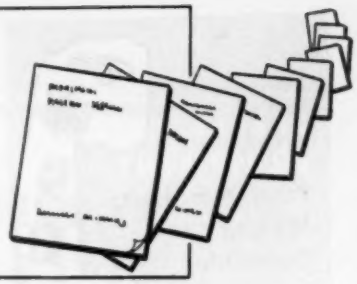
* * *

The Fire Extinguisher Division of Ansul Chemical Co. announces the opening of a new district office in Buffalo, N. Y. This territory, comprising the 17 western counties of New York State, had been operated by Plant Equipment Corp., an Ansul distributor.

Leslie J. Wiechers, former manager of Ansul's Indianapolis office, will head the Buffalo staff. He is assisted by Omar J. Lane and Charles Howson.

TRADE PUBLICATIONS
in the Safety Field

These trade publications will help you to keep up-to-the-minute on new products and developments in industrial health and safety equipment. They are free and will be sent by manufacturers without obligation to readers of NATIONAL SAFETY NEWS who are responsible for this work. Send in the coupon below checked for the publications you desire. Please make your requests promptly.



1. **Safety Guards:** Illustrated brochure describes new safety guard for presses. Guard designed as secondary, or hand in press guard, but may be used as primary. Not a sweep guard. Made for presses with strokes from 1 to 6 inches. Jamestown Safety Guard Corp.

2. **Floor Maintenance:** Booklet with pictures gives information on floor cleaning and maintenance equipment. Dry scrubbing, shower feed scrubbing, dust control and refinishing and maintenance fully described. Hild Floor Machine Co.

3. **Efficient Air Control:** Pamphlet describes in detail air ejection sets; two handed, foot operated and air operated kick press controls; air cylinders and air control accessories. Also included are air pressure regulators, valves, blow guns, reels, fermules and air line equipment. A. Schrader's Son.

4. **Safety Clothing:** Illustrated catalog of protective gloves, handguards, mittens, arm protectors, aprons, legwear and suits includes specifications. Industrial Gloves Co.

5. **Insecticide Atomizer:** Booklet with illustrations describes new atomizer which produces dense insecticidal fog. Operated by air pressure, steam pressure, or carbon dioxide gas pressure. Produces particles so small they will not condense on equipment. West Disinfecting Co.

6. **Punch Press Safety Guide:** Pocket-sized handbook written for foremen, die setters and operators describes inspection, adjustment and maintenance procedure for punch presses using "pullback" punch press safety devices. Positive Safety Mfg. Co.

7. **Eye and Face Protectors:** Goggles, helmets, hand shields and their accessories are featured in this illustrated catalog. Respirators and other safety equipment are included. Ask for price list No. 27-C. Sellstrom Mfg. Co.

8. **Trackmobile:** Brochure with illustrations describes new road and track vehicle designed for spotting, switching and hauling railroad cars. Vehicle is equipped with retractable road wheels and four standard AAR steel track wheels. Hydraulic Jacking is used in coupling and vehicle is easily operated by one man. Develops 7350 pounds of drawbar pull. Whiting Corp.

9. **Portable Dry Chemical Engine:** Photographs and text of this pamphlet describe giant portable dry chemical extinguisher. Tank holds 350 pounds of dry chemical mixture. Operating and maintenance data included with specifications. American La-France-Foamite Corp.

10. **Pyrometer:** Pamphlet contains series of blueprint detail drawings showing operating features of new safety device for protection against temperature damage. Designed for use on regulated furnaces, but can be used as only control instrument on a process that requires a complete shutdown upon reaching a final pre-set temperature. May be used to sound alarm and/or as shut off device. Illinois Testing Laboratories, Inc.

11. **Materials Handling Equipment:** Bulletin 29 describes the standard line of two and four wheel trucks commonly used by industry, warehouses and trucking companies. Special models also included as are electrical and gas electric trucks. Lewis-Shepard Products, Inc.

12. **Steel Scaffolding:** New catalog of sectional steel tubing units is illustrated with pictures of equipment in use. Complete description of units: scaffold jacks, scaffolding and swing scaffolds is provided. Suggested working plans included. Wilson-Albrecht Co., Inc.

13. **Cut-Out Couplings:** Catalog describes a complete line of cut-out couplings and completely redesigned line of cut-out pulleys. Diagrams show operating features and complete engineering data are included for both couplings and pulleys. Anchor Steel and Conveyor Co.

14. **Protection from Corrosion:** A corrosion-resistant metal is the subject of a new folder now available. Brief description of alloys recommended for corrosion applications along with their physical properties and a guide to chemical agents best handled are included. Also information on sheet and plate, pipe and tube, electrodes and others. Ampco Metal, Inc.

15. **Safety Belts:** New Bulletin CF-26 covers complete line of safety belts. Sections are devoted to body type, harness, bridge and structural steel workers', linemen's and petroleum workers' belts and miscellaneous safety belts. Belts are made of both leather and webbing. Mine Safety Appliances Co.

16. **Barrel Lift:** Illustrated folder describes new barrel transporting tool which enables a single operator to raise, transport, rotate, tilt and drain a fully loaded drum quickly and efficiently. All steel welded construction. Adjustable leverage feature for drums of different weights from 500 to 750 lbs. Falstrom Co.

17. **For Slipproof Floors:** Pamphlet tells of advantages of material designed to prevent slipping accidents on slick oil covered floors. Non-inflammable product eliminates accident hazards and improves appearance of unsightly and dangerous looking greasy floors. Canfield Oil Co.

18. **Waterfog Nozzle:** Text and pictures of this folder describe new type "B" 500 G.P.M. high capacity waterfog nozzle designed for use on deluge guns, ladder pipes, and other equipment used to control fires in buildings and flammable liquids. Discharge chart included. Rockwood Sprinkler Co.

NATIONAL SAFETY NEWS

425 N. MICHIGAN AVE.
CHICAGO 11, ILLINOIS

FEBRUARY, 1951

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For prompt service and friendly assistance on personal safety problems, call on your local distributor.

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ATLANTA, GA.—Fulton Supply Co.
BALTIMORE, MD.—Carey Mach. & Sup. Co.
BIRMINGHAM, ALA.—Safety Engrg. & Supply Co.
BOSTON, MASS.—Cutter, Wood & Sanderson Co.
BUFFALO, N. Y.—American Allsafe Co.
BUTTE, MONT.—Montana Hardware Co.
CASPER, WYO.—Casper Supply Co.
CHARLESTON, S. C.—Cameron & Barkley Co.
CHARLESTON, W. VA.—Safety First Supply Co.
CHATTANOOGA, TENN.—C. D. Genter Co.
CHICAGO, ILL.—Protective Equipment, Inc.
CINCINNATI, OHIO—The E. A. Kinsey Co.
CLEVELAND, OHIO—Safety First Supply Co.
COLUMBUS, OHIO—The E. A. Kinsey Co.
DALLAS, TEXAS—Engineering Supply Co.
DAYTON, OHIO—The E. A. Kinsey Co.
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GREENSBORO, N. C.—Smith-Courtney Co.
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HICKORY, N. C.—Smith-Courtney Co.
HOUSTON, TEXAS—Allied Safety Equipment, Inc.
INDIANAPOLIS, IND.—The E. A. Kinsey Co.
JACKSONVILLE, FLA.—Cameron & Barkley Co.
KALAMAZOO, MICH.—Safety Service Inc.
KANSAS CITY, KANS.—L. R. Stone Supply Co.
LOS ANGELES, CALIF.—E. D. Bullard Co.
LOUISVILLE, KY.—Noill-LaVielle Supply Co., Inc.
MEMPHIS, TENN.—J. E. Dilworth Co.
MILWAUKEE, WIS.—Protective Equipment, Inc.
MUSKEGON, MICH.—Factory Supply Co.
NEWBURGH, N. Y.—W. L. Smith Co.
NEW ORLEANS, LA.—Woodward, Wight & Co., Ltd.
NEW YORK, N. Y.—W. S. Wilson Corp.
OKLAHOMA CITY, OKLA.—Hart Industrial Supply Co.
OMAHA, NEBR.—Interstate Machinery & Supply Co.
PHILADELPHIA, PA.—Industrial Products Co.
PITTSBURGH, PA.—Safety First Supply Co.
PORTLAND, ORE.—J. E. Haseltine & Co.
PROVIDENCE, R. I.—James E. Tierney
RICHMOND, VA.—Smith-Courtney Co.
ST. LOUIS, MO.—Shipo, Incorporated
ST. PAUL, MINN.—Farwell, Ozmun, Kirk & Co.
SALT LAKE CITY, UTAH—Industrial Supply Co., Inc.
SAN FRANCISCO, CALIF.—E. D. Bullard Co.
SANTA FE, N. MEX.—Hendrie & Bolthoff Co.
SAVANNAH, GA.—Cameron & Barkley Co.
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